ACCOUNT NUMBER: **10038030-00**

COMPANY NAME: **BRIDGETON LANDFILL LLC**

CORRESPONDENCE

FROM 10-30-12 THRU 12-21-12

X	CORRESPONDANCE LOCATED IN OVERFLOW INDUSTRY FILE

Metropolitan Saint Louis Sewer District
2350 Market Street
Saint Louis, Missouri 63103-2555

BRIDGETON LANDFILL LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044

Attn: David Vasbinder
Environmental Manager

INDUSTRIAL WASTEWATER DISCHARGE PERMIT NUMBER 1003803000.

ANNUAL PERMIT FEE NOTICE

For permits in effect as of 10/01/2012.

Fee will be included in a **next regular monthly bill** from the Metropolitan St. Louis Sewer District.

Explanation of Charges

Fee for Pretreatment Program Discharge Permit covering the period October 1, 2012 through September 30, 2013 issued in accordance with the Metropolitan St. Louis District Ordinance #12413 for the location at **13570 St. Charles Rock Road**.

Base charge @ $150.00 per permit		$150.00
Volume charge @ $0.72 per average daily Ccf	251.60 Ccf(s)	$181.15
Sample Point Charge @ $100.00 per sample point	2 Point(s)	$200.00
	Total Fee Due:	**$531.15**

For inquiries about the Annual Permit Fee, please call 314-436-8756. For inquiries about payment of the fee, which will appear on your upcoming monthly bill, please call 1-866-281-5737.

THIS IS NOT A BILL

DO NOT PAY NOW

FEE WILL BE INCLUDED ON MONTHLY BILL

Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

December 21, 2012

Bryan Sehie, Environmental Specialist
BRIDGETON LANDFILL LLC
13570 St. Charles Rock Rd.
Bridgeton, MO 63044

Re: MSD Permit #: 0511559802 – 2
For Premise: 13570 St. Charles Rock Rd., 63044

Dear Mr. Sehie:

As recently discussed via phone, we wanted to clarify the requirements for sampling when submitting Total Toxic Organics (TTO) results.

A review of our database shows that you have been submitting results of grab samples for the various EPA Methods that make up the TTO. We understand your argument that since TTO is presented in your Permit as an Instantaneous Limit, you concluded that it should be borne from grab sampling. This is not the intent of the TTO Limit; it was simply presented as an Instantaneous Limit because of guidance that we received from our EPA Region 7 contact. They stated that the Limit is presented as Instantaneous because it is a summation of all constituents that are present at or above 0.01 mg/L from the volatile and semi-volatile organics and pesticide methods. The summation includes results from volatile organics under Method 624 (which defines the sampling method as grab sampling), from semi-volatile organics under Method 625 (which defines the sampling method as composite sampling), and from pesticides under Method 608 (which defines the sampling method as composite sampling).

In your Permit's General Conditions, Section 1.A.3 addresses TTO, and states:

> Unless specified otherwise in Section II of these conditions, all samples collected to satisfy the monitoring and reporting requirements of this permit, shall be of the following types:
>
> a. Temperature, pH and chlorine residual measurements, when required, shall be made on-site at the points of discharge and those measurements reported as grab sample results except, if continuous monitoring is employed for pH and/or temperature, reporting shall be as per paragraph A.7 below.
>
> b. For oil and grease, total phenols, cyanide, sulfide and **volatile organics**, when required, samples shall be GRAB SAMPLES.
>
> c. For **all other pollutants**, samples shall be COMPOSITE SAMPLES made up by combining a minimum of four individual grab samples within a 24-hour period. The individual grabs must be adequately flow or time proportioned to ensure a composite sample that is representative of that day's discharge.

In our Ordinance 12559, we defer to the Federal Regulations. Article X, Section Two, Subsection A states:

> All sampling and analyses performed to satisfy the monitoring and reporting requirements of this Ordinance shall be performed in accordance with the techniques prescribed in 40 CFR 136 and amendments thereto unless other techniques are prescribed for specific parameters or specific circumstances.

In the future, please have your sampling contractor extract grab samples for the volatiles and composite samples for the semi-volatiles and pesticides.

Thank you for helping us to comply with state and federal regulations. If you have any questions, please contact me at 314.436.8719.

Sincerely,

METROPOLITAN ST. LOUIS SEWER DISTRICT

Tom Boehm
Environmental Engineering Associate
tcboeh@stlmsd.com

Doug Mendoza

BRIDGETON LANDFILL
1003863000

From: Nora C. Estopare
Sent: Friday, December 14, 2012 5:15 PM
To: Rob G Daly; Jonathon Sprague; Michael Grace; Ryan Sabourin; Doug Mendoza
Subject: RE: Westlakes PS Site Conditions Review

All,
I received a phone call from one of our contacts at the Bridgeton Landfill, Dave Vasbinder. According to Dave, the Bridgeton Landfill and MDNR had a meeting yesterday. I am unsure of all the topics they discussed. The purpose of Dave's phone call to me was to let me know that Bridgeton Landfill is willing to take any steps necessary that are requested by MSD. This includes hiring contractors to enter and make repairs our Westlake Landfill Pump Station.

I told Dave that MSD is having an internal meeting this upcoming Tuesday. He offered to attend and to address our concerns. I told Dave that I would consult with this group as to whether or not his attendance was desirable and get back to him on Monday.

Please let me know your thoughts on having Dave Vasbinder attend any part of our meeting.

Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

-----Original Appointment-----
From: Rob G Daly
Sent: Thursday, December 13, 2012 9:55 AM
To: Rob G Daly; Jonathon Sprague; Michael Grace; Ryan Sabourin; Doug Mendoza; Nora C. Estopare
Subject: Westlakes PS Site Conditions Review
When: Tuesday, December 18, 2012 1:00 PM-2:00 PM (UTC-06:00) Central Time (US & Canada).
Where: Conf MKT 405

All

I would like to request a short meeting to review the ongoing situation at our Westlakes Pump Station and its impacts to our ability to operate and maintain the facility.

End result- we have a site where the ongoing conditions created by the Bridgeton landfill are creating an occupational safety issue for our staff.

Goal is to review efforts by PS Division, RM, and DEC to date- identify longer term plan of action by DEC to address root cause of situation on site and, more importantly in the short/mid term- identify our plan of how to operate and maintain the facility without imposing excessive long term occupational health and safety risk to our field staff who routinely access the station.

/m

03

BRIDGETON LANDFILL, LLC

Mr. Chris Bulmahn
Environmental Engineer
Metropolitan St. Louis Sewer District
10 East Grand Avenue
St. Louis, MO 63147-2913

December 13, 2012

Dear Mr. Bulmahn:

Metropolitan St. Louis Sewer District – Administrative Compliance Order
Action Item #2 and Progress Report,
Bridgeton Landfill, LLC. Discharge Permit No. 0511559802-2

The Bridgeton Landfill, in accordance with the Metropolitan St. Louis Sewer District (MSD) Administrative Compliance Order (AO), which was signed by legal representatives of MSD and the Bridgeton Landfill, LLC and entered effect on October 29, 2012, respectfully submits this schedule of actions as outlined in the AO, Action Item #2. Additionally, MSD issued the Bridgeton Landfill letters detailing a series of Total Phenol, Benzene, and Total Toxic Organic samples collected at the facility effluent located within the Westlake Pump Station on the dates of November 2, 13, and 29, 2012, respectively. Included in this Progress Report is, the facility's acknowledgement of those correspondence, and a summary of intention to collect additional samples.

As required per Action Item #2, the Bridgeton Landfill shall submit a schedule of actions for the design, installation, and operation of the procedures and pretreatment options identified in AO Finding #8 which states that the Bridgeton Landfill is in the process of investigation for the implementation of the following pretreatment options in which to eliminate the occurrence of future prohibited discharges at Leachate Outfall 008: a.) Installation and operation of a supplemental "enclosed" flare, as well as a supplemental "candlestick" utility flare within the landfill's gas collection and control system; b.) Design and operation of air monitoring / moving engineering controls at the landfill's outfall to the MSD sewer system within the Westlake Pump Station, and; c.) Installation and operation of a foam suppressing agent. The following table outlines current progress and planned actions to be taken at the Bridgeton Landfill in regard to the aforementioned items.

Finding No.	Proposed Option	Complete (Yes/No)	Completion Date
8a(1)	Installation and Operation of Additional Enclosed Flare	Yes	2-Oct-12
8a(2)	Installation and Operation of Supplemental Candlestick Flare	Yes	18-Jul-12
8b	Design and Operation of Air Monitoring/Moving Engineering Controls within Westlake Pump Station	No	Pending
8c	Installation and Operation of a Foam Suppression Agent	No	Installation Suspended

RECEIVED
DEC 14 2012
DIVISION OF
ENVIRONMENTAL COMPLIANCE

13570 St. Charles Rock Road
Bridgeton, MO 63044

Telephone (314) 744-8190
Fax (314) 739-2588

The Bridgeton Landfill completed the construction and testing phases of the supplemental "candlestick" flare on July 18, 2012 (Finding 8a(2)). The flare is currently fully operational, adding an additional gas extraction capacity between 1200 and 1770 scfm to the existing gas collection and control system at the facility. The candlestick flare is designed to work in tandem with the facility's existing 3500 scfm "enclosed" flare to extract gases from within the landfill waste cell and route them to thermal destruction.

The second "enclosed" flare was officially brought online on October 2, 2012. The new enclosed flare, similar to the facility's existing enclosed flare, adds additional 3500 scfm of gas extraction capacity to the landfill's gas collection and control system. It is anticipated, with the combined three operational flares, that gas and odors will be better controlled and routed for thermal destruction therefore reducing potential migration into other systems at the facility and the surrounding environment. Each of the flares are operated and maintained under a site-specific program which is designed to enable landfill personnel to minimize down-time and provide peak system performance efficiency.

The design and development of the proposed air quality engineering controls, which are to be constructed and operated at the Westlake Pump Station (Finding 8b), are not complete, however progress has been made. Meetings regarding the development of a plan of action for designing and constructing these air quality engineering controls were held at the MSD office on August 21, and September 24, 2012 between; MSD Environmental Compliance representatives; MSD Operations representatives; and Bridgeton Landfill personnel. During the week of October 8, 2012 coordination of necessary materials and contractor services were initiated by the Bridgeton Landfill via telephone and email. Per these efforts a series of on-site meetings were held at the Westlake Pump Station to finalize the design of the system and to secure an incoming power supply. The Bridgeton Landfill continues to prepare for the purchase of the necessary materials to undertake the system's construction. The Bridgeton Landfill has successfully procured the funds necessary to purchase the materials and services required to initiate and complete this project. No material purchases have been made as of the date of this report due to MSD Operations personnel not having finalized decisions regarding desired system operating conditions and alarming points. Based on lead times for project material delivery provided by the individual equipment manufacturers', and under the assumption that MSD Operations personnel finalize desired system parameters before the end of the year, the following schedule of action is anticipated:

Item	Estimated Completion Date
Underground Utility Location	15-Jan-13
Ameren Power Installation	15-Jan-13
Ordering of Air Quality Monitor	15-Dec-12
Ordering of Drum Scrubber	31-Dec-12
Ordering of Telog Call Unit	31-Dec-12
Construction of Air System	15-Mar-13

In a letter from MSD dated December 4, 2012, it was declared that the Bridgeton Landfill was no longer required to construct and operate a foam suppression system at the facility unless future foaming incidents occur. The Bridgeton Landfill will continue to monitor the Westlake Pump Station as well as the Leachate Tank System for indicators of foaming.

In a letter issued to the Bridgeton Landfill by MSD on November 2, 2012, the facility was advised that MSD personnel collected a series of grab samples at the Westlake Pump Station on the dates of October 4, 5, 10, and 11, 2012. Laboratory analytical results from this sampling reported concentrations of Total Phenols of 38.14 mg/L, 77.85 mg/L, 60.65 mg/L, and 53.93 mg/L, respectively. Each of these results was in exceedance of the District's limitations for treatment plants discharging into the Missouri and Mississippi Rivers' according to MSD Ordinance No. 12559 (21 mg/L). The Bridgeton Landfill was advised by MSD that, as explained in the Significant Noncompliance Enclosure provided with the letter, that a minimum of nine (9) Total Phenols samples must be collected within the confine of the six-month review period ending on December 31, 2012, and that each of the nine (9) samples must report values below the 21 mg/L limitation to avoid remaining in Significant Noncompliance status.

In a subsequent letter, dated November 29, 2012, MSD stated that, due to an error in analytical data calculation, the abovementioned Total Phenol detections were "not to be considered exceedances of Ordinance Limitations." The letter continued to explain that two (2) of the samples, collected on October 10, and 11, 2012, did exceed the facility's Discharge Permit limitation for TTO of 5.844 mg/L, as they held TTO concentrations of 8.370, and 10.710, respectively. The Bridgeton Landfill now understands that it must collect sufficient samples, to be analyzed for TTO, to prove a return to compliance prior to the end of the six-month reporting period ending on December 31, 2012. An additional letter from MSD to the Bridgeton Landfill dated November 13, 2012 stated that a series of volatile organic samples conducted by MSD at the Westlake Pump Station on October 22-23, 2012 reported Benzene concentrations in exceedance of the Gas/Vapor Toxic Screening Level under MSD Ordinance No. 12559. Additional Benzene samples will also be collected in conjunction with TTO sampling. The Bridgeton Landfill has ordered sufficient sample kits to perform the required analysis and will present the results to MSD as they are available.

Please contact me at 314-744-8166 if you have any questions or comments.

Sincerely,

BRIDGETON LANDFILL, LLC.

David Vasbinder
Environmental Manager

BRIDGETON LANDFILL

Doug Mendoza

From: Nora C. Estopare
Sent: Monday, December 10, 2012 3:31 PM
To: Lehman, Larry; Norris, Dan
Cc: Doug Mendoza; Christopher J. Bulmahn; Tom Boehm
Subject: RE: Bridgeton Sanitary Landfill Air Sampling Plans

Larry and Dan,

Thank you for forwarding copies of the consultant's air monitoring workplan and MDNR's sampling plan for oversight.

Here is a breakdown from MSD's Pretreatment industry files. The data is from self-monitoring discharge volume reported by the Bridgeton Landfill.

From July 1 (Q3) 2008 thru June 30 (Q2) 2009		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
0511559802	BRIDGETON LANDFILL LLC	8.017723	8.5006	7.271596	9.812014	8.960091	8.0145	8.689955	6.34953	7.246619	6.83263	6.8396	6.63471

From July 1 (Q3) 2009 thru June 30 (Q2) 2010		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
0511559802	BRIDGETON LANDFILL LLC	5.8999	6.2936	5.8844	4.413	6.048	7.696	8.581	9.142	9.987	9.049	6.628	6.472

From July 1 (Q3) 2010 thru June 30 (Q2) 2011		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
0511559802	BRIDGETON LANDFILL LLC	5.719	4.469	4.755	4.756	4.362	4.791	4.713	4.497	4.827	2.986	4.548	5.059

From July 1 (Q3) 2011 thru June 30 (Q2) 2012		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1003803000	BRIDGETON LANDFILL LLC	5.779	5.438	4.745	4.495	4.129	5.674	4.472	3.475	1.343	1.366	1.587	4.734

From July 1 (Q3) 2012 thru June 30 (Q2) 2013		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1003803000	BRIDGETON LANDFILL LLC	3.265	4.742	2.978									

MSD 024464

Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

From: Lehman, Larry [mailto:larry.lehman@dnr.mo.gov]
Sent: Monday, December 10, 2012 2:37 PM
To: Norris, Dan; Nora C. Estopare
Subject: RE: Bridgeton Sanitary Landfill Air Sampling Plans

Thanks Dan.
Nora – does MSD have records on the amount of leachate discharged from Bridgeton LF to the sewer? If so, we would like the see the past 5 years if possible. Thank you.

Larry Lehman
Compliance/Enforcement Section Chief
Solid Waste Management Program
Department of Natural Resources
PO Box 176
Jefferson City, MO 65102
Fax (573) 526-3902
Phone (573) 751-5401

From: Norris, Dan
Sent: Monday, December 10, 2012 2:09 PM
To: Nora C. Estopare
Cc: Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda; Roth-Roffy, Brian; Lehman, Larry
Subject: Bridgeton Sanitary Landfill Air Sampling Plans

Nora,

Thanks to you and others with MSD for taking the time to speak with us this afternoon regarding conditions in the MSD lift station adjacent to Bridgeton Sanitary Landfill. As you requested, I have attached copies of Stantec's (Bridgeton's air monitoring consultant) air monitoring workplan and our sampling plan, which is mainly an oversight plan. If you have questions about the workplans or the air sampling event, you are welcome to contact me.

Thank you,

Mr. Dan Norris, Environmental Specialist
Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
573-526-3915 (Direct)
573-751-5401 (Main)

Doug Mendoza Bridgeton Landfill

From:	Norris, Dan <dan.norris@dnr.mo.gov>
Sent:	Monday, December 10, 2012 2:09 PM
To:	Nora C. Estopare
Cc:	Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda; Roth-Roffy, Brian; Lehman, Larry
Subject:	Bridgeton Sanitary Landfill Air Sampling Plans
Attachments:	Bridgeton Air Sampling Plan 8-14-12.doc; Stantec Workplan_revised_8-14-2012.docx

Nora,

Thanks to you and others with MSD for taking the time to speak with us this afternoon regarding conditions in the MSD lift station adjacent to Bridgeton Sanitary Landfill. As you requested, I have attached copies of Stantec's (Bridgeton's air monitoring consultant) air monitoring workplan and our sampling plan, which is mainly an oversight plan. If you have questions about the workplans or the air sampling event, you are welcome to contact me.

Thank you,

Mr. Dan Norris, Environmental Specialist
Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
573-526-3915 (Direct)
573-751-5401 (Main)

Air Sampling Work Plan

Bridgeton Landfill, LLC Bridgeton MO

1.0 INTRODUCTION

The goal of the sampling described in this Work Plan is to identify and quantify chemical constituents in air that are of potential concern to public health and may also be associated with thermal decomposition byproducts in gases from the Bridgeton Landfill. Source gas from the landfill, air at selected locations on the landfill, at downwind locations where the odor is present, and at upwind locations (where the odor is not present) will be evaluated for an extensive list of parameters that include chemicals of potential concern to public health and chemicals potentially associated with the odor.

Analytical results, including those representing local/regional background ambient air quality will be compared to relevant benchmarks such as the conservative USEPA risk-based screening levels (May 2012 Regional Screening Levels, or RSLs) for residential and industrial ambient air; ATSDR Minimal Risk Levels (MRLs); USEPA screening levels from the school air toxics program; occupational exposure standards/guidelines; US background ranges; and odor thresholds.

2.0 IDENTIFY CHEMICAL CONSTITUENTS OF DECOMPOSITION BYPRODUCTS AND ODOR

At the request of Missouri DNR, the air sampling will address a comprehensive list of constituents. All samples will be analyzed by a laboratory that is certified to run the analytical suites described below. The laboratory will provide the appropriate sampling media for each of the proposed analytical methods. Stantec will subcontract directly with the laboratory for the analyses. It is currently proposed to use Columbia Analytical Laboratories for the majority of analyses for this investigation. Table 1 presents a listing of all target analytes for the proposed sampling along with Method Reporting Limits (MRL). Table 2 contains links to Standard Operating Procedures for each of the analytical groupings discussed below. Samples will be collected according to the protocols specified.

2.1 Volatile Organic Compounds

Volatile Organic Compounds (VOCs) arise from many sources and are frequently found at low concentrations in ambient and indoor air. At higher concentrations than typically found in ambient air, individual VOCs have odors that are generally described as "sweet", "ether-like", or "solvent-like". Occupational exposure to much higher than ambient concentrations of some VOCs such as benzene have been shown to cause adverse health effects under certain circumstances of exposure. Thus it is important to document the concentrations of VOCs in ambient air resulting from landfill emissions and assess such concentrations as compared to levels of public health concern.

Automotive emissions, refrigerants, solvents and consumer products are common sources of specific VOCs such as benzene, ethylbenzene, toluene, xylene, dichlorofluoromethane, chloroethane and chloromethane, trichloroethene and tetrachloroethene. These same compounds are also commonly found in landfill gas. Because VOCs are ubiquitous in ambient air, it is critical to characterize the specific compounds and concentrations in local/regional background.

Air samples will be collected in evacuated SUMMA Canisters provided by the laboratory and evaluated for a standard list of target analyte VOC compounds by EPA Method TO-15.. Additional analysis will be conducted for Tentatively Identified Compounds (TICs). It is proposed to use NIOSH 2549 to sample for VOCs in source air where the levels are anticipated to be higher than the range of concentrations accommodated by the SUMMA Canister collection. The majority of the standard analytes for these analytical methods (e.g. benzene) do not have odors at concentrations that are typically found in ambient air. However, some of the compounds that can be detected as TICs have lower odor thresholds.

2.2 Reduced Sulfur Compounds

Many sulfur compounds produced during the decomposition of organic wastes have objectionable odors at very low concentrations. Some of these sulfur compounds such as hydrogen sulfide can be extremely hazardous at high concentrations well above the odor threshold (smell of rotten eggs). The mercaptans include compounds that are added to natural gas as odorants for purposes of detecting gas leaks and also are compounds associated with the odor of paper mills.

Air samples will be analyzed by ASTM Method D5504-01 for reduced sulfur compounds including hydrogen sulfide, carbon disulfide, carbonyl sulfide, diethyl disulfide, diethyl sulfide, dimethyl disulfide, thiophene and mercaptan isomers.

2.3 Ammonia

Ammonia has a familiar objectionable odor at low concentrations, is produced during the decomposition of wastes. Ammonia becomes a health concern at concentrations much higher than its low-odor threshold. OSHA Methods ID-188 will be used to quantify air samples for ammonia.

2.4 Amines

Like ammonia, amines are produced during the decomposition of nitrogen-containing organic wastes and are major contributors to the offensive smell of rotten fish. Amines have odor thresholds that are orders of magnitude below concentrations of concern for public health.

The sample collection protocol for Columbia Analytical Services AQL Method 101 in Table 2 will be followed. The 13 specific amines detected by this method are: butylamine and isomers, ethyl and diethylamine, diisopropylamine, dipropylamine, dimethylamine, isobutylamine, isoprpoylamine, propylamine, triethylamine and trimethylamine.

2.5 Carbonyl Compounds (Aldehydes)

Aldehydes are a group of compounds that have numerous natural and anthropogenic sources. Low molecular weight aldehydes such as acetaldehyde and formaldehyde are produced by natural biological processes, are found in automotive emissions and are important ingredients in consumer products. The higher molecular weight aldehydes (e.g. valeraldehyde) tend to have distinct (and sometimes unpleasant) odors at low concentrations; and some are used as ingredients in flavorants and in fragrances. Very low concentrations of aldehydes are common in ambient and indoor air. Exposure to very high concentrations of formaldehyde and acetaldehyde in occupational settings can produce adverse health effects. Air samples will be analyzed by EPA Method TO-11A for this group of compounds.

2.6 Carboxylic Acids

Also known as volatile fatty acids or organic acids, the carboxylic acids are generally associated with odors from decomposition of organic materials in composting operations, wastewater treatment plants and some landfills. The 15 target analytes in this group of compounds include acetic acid, butyric, valeric acid and related low molecular weight compounds. The sample collection protocol for Columbia Analytical Services AQL Method 102 in Table 2 will be followed.

2.7 Dioxins/Furans

The polychlorinated dibenzo-p-dioxins and dibenzofurans (dioxins/furans) comprise over 100 isomers that differ with respect to the number of chlorine atoms and the placement of the chlorine atoms on the two phenyl rings of the dioxin and furan structures, with the most toxic isomer being the 2,3,7,8-tetrachloro dibenzo-p-dioxin (TCDD). As chlorine atoms are added to the structure (up to eight possible), the toxicity of the isomers decrease. Very low concentrations of the higher chlorinated isomers are common in ambient air from a variety of combustion sources. EPA Method TO-9 will be used to sample for dioxins/furans. This method requires the use of a high-volume sampler over a 24-hr period in order to be able to accumulate sufficient material for analytical quantification of the dioxins and furans. The high-volume sampler requires an AC power source. The majority of sample locations identified by Stantec and MDNR have 110V AC power sources within reach using extension cords. The only exceptions are the proposed upwind locations on the northwestern side of the landfill. It is proposed to power the high-volume samplers at these locations using gasoline powered generators that will be placed downwind and sufficiently far away as to not introduce extraneous fuel combustion constituents.

2.8 Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are a group of structurally related aromatic hydrocarbons that are most commonly associated with combustion of fossil fuels, petroleum products, and combustion of other types of organic material (e.g. tobacco smoke). Benzo(a)pyrene is the best-characterized PAH with regard to toxicity. It is proposed to use EPA Method TO-13 A or NIOSH Method 5506 to analyze for the PAHs. The PAH target analytes for these methods can be found in Table 1. As with the dioxins/furans, high-volume samplers are operated for 24 hours to accumulate sufficient mass of PAHs to be able to detect these compounds because of the very low concentrations present in air. The same considerations apply with regard to accessible 110V AC power sources and/or generators.

2.9 Hydrogen Cyanide

NIOSH Method 7904 will be used for hydrogen cyanide to avoid interference by hydrogen sulfide. NIOSH Method 6610 is an alternative for hydrogen cyanide but is not appropriate for this application because hydrogen sulfide can interfere with the analysis; and it is likely that hydrogen sulfide is present in the source gas and possibly in air.

2.10 Mercury

NIOSH Method 6009 will be used to analyze for elemental mercury, and organic mercury compounds.

2.11 Fixed Gases

EPA Method 3C will be used to analyze for hydrogen, methane and carbon monoxide. The landfill is required to monitor for these gases on a regular basis.

2.12 Definition of a Sample Set

As indicated above, the number of samples for dioxins/furans and PAHs is constrained by the availability of the special sampling apparatus required to collect sufficient mass for these analyses. For all other parameters, a sample set is defined as one each:

- Volatile Organic Compounds: SUMMA Canister for EPA Method TO-15 + TICS
- Reduced Sulfur Compounds: ASTM Method D5504 collected in Tedlar Bag
- Ammonia: OSHA ID-188 collected on sorbent tube
- Amines (Aliphatic): CAS AQL Method 101 collected on sorbent tube

- Carboxyllic Acids: CAS AQL Method 102 collected on sorbent tube
- Carbonyl Compounds (Aldehydes): EPA Method TO-11A collected on sorbent tube
- Hydrogen cyanide: NIOSH Method 7904
- Elemental and Organic Mercury: NIOSH Method 6009
- Fixed Gases (hydrogen, methane and carbon monoxide): EPA Method 3C

Table 1 summarizes the analytical groups and sample collection methods proposed for source gas and air.

2.13 Standard Operating Procedures

Table 2 summarizes the SOPs for all of the analytical groups described in this work plan. The table contains links to the sample collection protocols that will be used during this investigation.

Field blanks will be submitted in a ratio of 1 blank for every three samples. Additional field blanks may be submitted to represent different lots of sorbent tubes from the supplier. Field blanks will accompany samples for ammonia, amines, carboxylic acids and carbonyl compounds. Blanks will be prepared by breaking the ends of the sorbent tubes and then placing caps over the ends without drawing air through the tubes. The purpose of the field blanks is to verify that the sorbent media as received from the manufacturer was free of the analytes of interest prior to collecting the samples. Field blanks are not typically submitted for SUMMA canister or Tedlar bag samples since the sample collection vessels do not contain a sorbent material.

3.0 AIR SAMPLING LOCATIONS

Candidate locations for the collection of source gas and air samples were identified in cooperation with representatives from Missouri DNR on August 9, 2012. As described above, sets of samples will be collected from representative locations on the landfill property line that are between the source(s) on the landfill and off-site receptors who are in close proximity. The exact locations will be determined according to meteorological conditions on the day(s) that the sampling is conducted. Early morning when the winds are generally calm will be the preferred time to collect samples in locations where the odor is present. With the exception of samples to characterize the constituents of interest in the source gas, samples of ambient air will be collected for a period of four (4) hours and at a height of approximately 3-5 feet (breathing zone) above the ground surface. It is anticipated that DNR representatives may accompany Stantec scientists as they collect samples.

3.1 Sources on the Landfill

Samples of source gas under the FML will be collected from three mutually agreed upon areas: the "amphitheater"; the top of the hill; and the eastern quarry area. To preclude dilution/interference from surrounding air, airtight ports will be installed on the FML through which the various sampling heads can be inserted, or through which air will be drawn directly from under the FML to the sample head. Small ports with barbed connectors will be used to draw gas into SUMMA Canisters for TO-15 analysis. MDNR will also collect a SUMMA Canister sample at each of the three FML locations, so two identical small ports will be installed at each location with sufficient distance between them to prevent interference. In addition to the small ports for collection into SUMMA Canisters, three additional larger ports consisting of lengths of 2" lightweight stainless steel pipe will be installed using appropriate fittings through the FML at each sample location. Two of the ports will be connected by piping to the high-volume samplers (one for the dioxin/furan and the second for the PAH analysis). This configuration will preclude the introduction of surrounding air into the source gas as it is drawn through the polyurethane (PUF) collection filters. The third port will be a longer length of pipe into which holes have been drilled to exactly accommodate the size of the media tubes or sampler head for the other analyses. All of the sampling ports will be fitted and sealed to prevent interference from surrounding air. All sampling will be performed with the sample head or sampler extension placed inside this steel pipe.

To make certain that there is sufficient available gas under the FML in the vicinity of the samplers (especially the high-volume samplers), it is proposed to "prop up" or tent the FML so that gas can accumulate. It is expected that the tenting and installation of sampling ports through the FML will be completed the day before the sampling event.

The active sampling techniques that will be used will also help to avoid potential cross-contamination. All commingled samples (sulfur compounds with H, CH4 and CO) are designed so there is no incompatibility. Hydrogen cyanide will be collected by a method where hydrogen sulfide cannot interfere with the analysis. To the extent possible, constituents in the source gas will be identified and quantified. Concentrations will be compared to occupational exposure standards as the most relevant benchmarks.

3.2 Air on the Landfill

A minimum of three locations on the surface of the landfill, but not drawing air from below the FML, will be selected based on the presence of the odor at the time the sampling is conducted. Samples will be collected at breathing zone height (3-5 feet above the ground surface).

3.3 Downwind at the Landfill Property Line

A minimum of six locations will be sampled to represent potential exposures to people who live or work in the vicinity of the landfill. Three samples will be collected from the fence line in the southeast corner of the landfill property. The east FML sample location is very close to the southeast corner and receptors are present within about 100 yards of the fence. Regardless of prevailing wind direction, the topography in the southeast corner forms a depression where the odor is frequently present. It is anticipated that these locations are most likely to represent "worst case" exposures to the people who live and work in close proximity to the landfill along Boenker Lane. Three other downwind locations will be determined by meteorological conditions at the time of sampling and by the presence of the odor at the landfill property line. Samples collected at the facility boundary between the source(s) and off-site downwind receptors are anticipated to represent the highest concentrations of constituents leaving the landfill and traveling into the surrounding community. Additional dilution would be expected with increasing distance from the source(s). Samples will be collected at breathing zone height by either securing the sampling devices to the fence or by constructing simple temporary platforms.

3.4 Local/Regional Background

Because many of the compounds that will be analyzed for have a number of potential non-landfill sources, it will be critical to adequately characterize local/regional ambient background. It is proposed to collect a minimum of six sets of samples from locations in the vicinity of the landfill that are upwind and not impacted by odor from the landfill at the time of the sampling. Regardless of prevailing wind direction, it is expected that three of the background samples will be collected near the northwest boundary of the landfill. Samples will be collected at breathing zone height as described above. Three additional sample sets will be collected at upwind sites determined by prevailing wind direction and the absence of perceptible odor at the time of sampling.

4.0 INVENTORY OF LOCAL AND REGIONAL SOURCES

The Bridgeton Landfill is near major highways and the St. Louis Airport, and is surrounded by other commercial and industrial operations. The highways and the airport are local/regional sources of common VOCs (e.g. benzene and related compounds), PAHs, low molecular weight aldehydes (e.g.

acetaldehyde and formaldehyde), and carbon monoxide. Stantec will compile an inventory of nearby commercial and industrial operations that may be sources of air emissions. The inventory of sources will be provided to MDNR. Understanding the locations of surrounding sources of the constituents of interest potentially associated with the Bridgeton Landfill odor will be critical in deciding where to take representative background samples and will inform interpretation of the analytical findings.

5.0 DISTRIBUTION OF SAMPLING RESULTS

It is anticipated that results will be available from the analytical laboratory approximately 2-4 weeks after the samples are submitted. Analytical information, chain of custody forms and results will be provided to the Missouri Department of Natural Resources within 48 hours of receipt by Bridgeton Landfill, LLC.

6.0 STANTEC QUALIFICATIONS TO UNDERTAKE THIS PROJECT

The Stantec team who will be conducting the monitoring and evaluating the results are all senior scientists, each with 25-30 years of relevant experience. Deborah Gray, Ph.D., DABT, Stantec Consulting Services National Director-Risk Assessment & Toxicology Practice will personally oversee every aspect of this project. Dr. Gray will be joined by John Reiter, Certified Industrial Hygienist, Michael Roznowski, engineer and Certified Safety Professional and Richard Pager, field sampling specialist. Resumes for Deborah Gray, John Reiter and Michael Roznowski are appended to this work plan.

Bridgeton Sanitary Landfill Air Sampling Plan
Revised August 14, 2012

PROPOSED DATES: SUMMA Canister sampling is to be conducted at the Bridgeton Sanitary Landfill. The sampling will be conducted side-by-side with the facility's contract consulting firm. In addition, the facility's contract consulting firm will collect other air monitoring samples, the collection of which will be observed by Environmental Services Program's Air Quality Monitoring Section (AQMS) staff, or other relevant Department staff. Solid Waste Management Program (SWMP) Staff will accompany the AQMS staff during the sample collection event. Sampling is planned to start in around the middle of August 2012, with the potential for additional sampling to occur sometime in the fall and winter of 2012. The necessity of any follow-up sample collection will be dependent upon the findings of the analytical results of the August samples.

LOCATIONS:
The samples will be collected at the Bridgeton Sanitary Landfill located at 13570 St. Charles Rock Road, Maryland Heights, St. Louis, Missouri.

MONITORING OBJECTIVES:

1) Collect individual SUMMA canister grab samples, representative of subsurface smoldering event byproducts as well as on-site air exposure to identify possible odor constituents and levels of hazardous air pollutants to assess whether health risks are associated with air emissions at that location.

2) Correlate data with the meteorological conditions the day of sample collection.

3) Observe the collection of all air quality monitoring samples conducted by the facility's contract consulting firm to document the procedures of the sample collector(s), and the conditions under which the samples are collected.

4) Review the analytical results of the air samples collected. Based upon the data collected, SWMP will determine whether additional, long-term sampling is needed to monitor specific constituent concentrations to protect landfill employees, transfer station workers, and occupants of adjacent properties.

PERSONNEL AND AGENCIES INVOLVED:

Stephen Hall, MDNR-APCP	(573) 751-4817
Darcy Bybee, MDNR-APCP	(573) 751-4817
Clifford Johnson, MDNR-APCP	(573) 751-4817
Joe Trunko MDNR-SLRO	(314) 416-2960
Jim Brunnert, MDNR-ESP-AQMS	(573) 526-3381
Celeste Koon, MDNR-ESP-AQMS	(573) 526-3363

Curt Leuckenhoff, MDNR-ESP-CAS	(573) 526-6972
Dan Norris, MDNR-SWMP-C/ES	(573) 526-3915
Cecilia Campbell, MDNR-SWMP-C/ES	(573) 526-3917
Brian Roth-Roffy, MDNR-SWMP-ES	(573) 751-5401
Chris Nagel, MDNR-SWMP	(573) 751-5401
David Vasbinder, Republic Services, Inc.	(314) 249-9404
Brian Sehigh, Republic Services, Inc.	(314) 744-8190
Deborah Gray, PhD, Stantec, Inc.	(614) 738-0791
John Reiter, Stantec, Inc.	(262) 349-2969

RESPONSIBILITIES

Serve as project leader	Dan Norris
Develop monitoring plan	Dan Norris/Cecilia Campbell/Chris Nagel/Jim Brunnert/Celeste Koon
Manage equipment	Jim Brunnert
Obtain permission for access	SWMP Staff
Handle news media inquiries	Renee Bungart
Prepare the FML for sample collection	David Vasbinder/Brian Sehigh
Participate in air monitoring sample collection	Jim Brunnert
Oversee collection of contract air quality sample collection	Jim Brunnert/Dan Norris/Brian Roth-Roffy
Collection of GPS sample location data	Dan Norris/Brian Roth-Roffy
Send canisters to laboratory	Jim Brunnert
Review analytical laboratory data and QA/QC	Curt Leuckenhoff
Prepare report on results	Jim Brunnert
Review report	Celeste Koon

EQUIPMENT TO BE USED:
Trimble GPS unit, 4-gas personal safety monitor, notebook, and SUMMA canisters

PROPOSED MONITORING SCHEDULE:
Samples are to be collected at the landfill locations according to the following schedule:

Day 1 SWMP staff will confirm with landfill manager that the Flexible Membrane Liner (FML) and any other source sampling locations are prepared for sample collection on Day 2. Late in the work day, SWMP and ESP staff will travel to Maryland Heights with sampling equipment. Confirm wind direction for the following day from the nearest forecast station using the NGM-MOS weather models available at www.weatherunderground.com. Travel to the landfill to meet with landfill representatives and view the prospective sample collection locations.

Day 2 Early in the day, re-load sampling equipment (if necessary), travel to the sampling site. Collect two SUMMA canister samples from underneath each area of the landfill covered by FML and one SUMMA canister sample from the landfill gas extraction system header line, for a total of three samples. All samples will be collected as grab samples. The collection of GPS locational data will be conducted concurrent with the air quality sampling. Designated staff will accompany the landfill's contract consultant(s) to observe the sampling methods used, and to document sample collection locations/sources, including collecting GPS locational data for all sample locations. Staff shall return to Jefferson City upon completion of sample collection observations and collection of GPS data.

TARGET ANALYTES:

Parameters to be collected by AQMS staff and sent off for analysis to their chosen contract laboratory are listed in Table 1, along with the method of analysis. Parameters that will be collected and analyzed by the landfill's contract consultant(s) and laboratory are listed in Table 2, along with the method of analysis and the limits of detection desired.

SAMPLING EQUIPMENT SITING:

Samples will be collected from 3 different areas under the FML installed over the surface of the landfill at the locations chosen during the August 9, 2012 site visit. Samples will be collected by both ESP and the landfill's consultant at these locations. These samples will be collected using sample ports installed by the landfill owner in advance of the sampling date. The sampling ports shall be installed in a manner that allows a representative sample to be collected from under the FML and does not contain solvents or glues that could cause invalid sample results.

Samples will be collected by the landfill's consultant only for all sample locations not under the FML. 3 open-air samples shall be collected at breathing-height (approximately 1-2 meters above the surface of the ground) on the landfill in areas where accumulation of emissions is likely or is observed due to the presence of odor on the day of sampling. 6 downwind samples will be collected at or near the property boundary, based on weather patterns on the day of sampling, odors, and historic complaints. 6 upwind samples will be collected at or near the property boundary, based on weather patterns and odors on the day of sampling.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES:

An additional sample shall be taken if a canister does not appear to function properly or have sufficient vacuum. A chain-of-custody record will be prepared for each canister sample. The SUMMA canister sampling will be conducted according to the Environmental Services

Program's *Quality Control Manual for Ambient Air Monitoring, Quality Control Procedures for Canister Sampling.*

Samples collected by the landfill's contract consultant will be observed by either AQMS staff or SWMP staff. They will maintain a field log book describing sampling activities and will note any deviations from the contract consultant's written QA/QC procedures that are to be provided in advance to the SWMP. SWMP staff will collect photographs and GPS locational data during the sampling event.

The analytical laboratory that performs the analysis of the canister samples is responsible for following its quality assurance/quality control procedures for TO-15 analysis; however, in the event the analysis is conducted by a contract laboratory, the QA/QC documentation provided by the contract laboratory will be reviewed by AQMS/CAS staff before official results are issued

DOCUMENTATION AND RECORDS TO BE KEPT DURING STUDY:
AQMS staff will keep a log for noting site activities related to monitoring. The field log shall include information such as site drawings, monitoring notes, and any notes about deviations from the monitoring plan or QAPP and observations about sample collection. All necessary records related to canister sampling and handling and GPS data collection will be kept, including chain-of custody forms for each sample.

DATA ANALYSIS PROCEDURES:
SUMMA Canisters will be analyzed by either the Department's lab or a contract lab using the methods listed in Table 1 (see attached), for the constituents listed in Table 1, at a minimum. Samples collected by the landfill's contract consultant will be analyzed for the selected compounds in Table 2, using the contract lab hired by the facility.

DATA FORMAT:
Analytical and any necessary meteorological data from the laboratory will be reported to the SWMP in accordance with ESP AQMS policies or SOPs. Whenever possible, results will be included in the form of a tabular text result sheet and in an electronic spreadsheet format. Values will be reported in ppbv, unless the analytical method specifies an alternate format.

DATA REVIEW AND VALIDATION:
The QA/QC documentation provided by the laboratory that analyzes the samples collected by AQMS staff and the landfill's contract laboratory will be reviewed by AQMS/CAS staff for factual errors, completeness, and consistency. AQMS/CAS or SWMP staff will contact the contract laboratory for corrections, if necessary. Review of both laboratories' analysis report,

matrix spike and matrix spike duplicate report, method blank analysis report, calibration and calibration checks report, laboratory control sample report, and a report indicating any abnormalities associated with the sample analyses will be conducted by AQMS staff. If any problems are identified, AQMS/CAS staff will contact their contract laboratory to determine appropriate corrective actions.

The final results of data collected and analyzed by the landfill's contract consultant will be provided to AQMS staff. If AQMS staff identify any factual errors or have questions, AQMS/CAS or SWMP staff will contact the landfill representative and ask them for clarification. The results provided by the landfill's contract consultant will be used for comparison to health related benchmarks.

PROJECT REPORT CONTENTS:
AQMS staff shall prepare a project report detailing the results of their observations of the sample collection event and provide analytical results following the receipt of analytical data. The contents of the project report will show the sampling locations, monitoring methodology, meteorological data (if needed), and the concentrations of the parameters detected in the samples. The report will be completed as soon as possible after receipt of all analytical laboratory results.

PROJECT REPORT RECIPIENTS:
Chris Nagel will be the recipient of the results and the final report.

FUTURE ACTIONS:
ESP, SWMP, HWP and/or APCP staff will review the data and final report and compare chemical compound concentrations to health-based screening levels identified in table 2.

Off-site or property line samples which exceed the other health benchmark specified in table 2 (or the OSHA PEL, where no other health benchmark has been identified) will require the preparation of a site-specific health-based risk assessment to ensure that the public is not exposed to potentially harmful concentrations of subsurface smoldering event byproducts. In the event a site-specific risk assessment is necessary due to the levels identified in the sampling, the Department will promptly request assistance from the Agency for Toxic Substances and Disease Registry and/or the United States Environmental Protection Agency.

On-site breathing zone samples which exceed the OSHA PEL specified in table 2 will require the preparation of a revised health and safety plan by the landfill owner to ensure that landfill workers and Department staff are adequately protected from subsurface smoldering event byproducts. In the event a revised health and safety plan is necessary due to the levels identified in the sampling, the Department will promptly notify Republic Services, the landfill owner, in writing and request that they prepare the revised plan and submit it for Department staff to review.

Source (under FML and gas extraction system) samples which exceed the OSHA PEL specified in table 2 will require the preparation of an on-going monitoring program for those compounds which exceed the PEL, to ensure that potentially hazardous levels of these constituents do not escape the landfill and cause OSHA PELs to be exceeded on-site or other health benchmarks to be exceeded off-site. In the event that source samples exceed OSHA PELs, the Department will notify Republic Services in writing and request that they prepare a plan for conducting quarterly monitoring on-site and at the property boundary for all compounds which exceed OSHA PELs, and provide to the Department for review.

Table 1. Constituents to be collected and analyzed during the air monitoring at Bridgeton Sanitary Landfill and the methods to be used to analyze the parameters.

Constituent	Analytical method	NIOSH REL	OSHA PEL	Other Health Benchmark	Health Benchmark Method
2-Butanone (methyl-ethyl-ketone)	EPA TO-15	200 ppm	200 ppm	5200 ug/M3	RSL RATL
Acetone	EPA TO-15	250 ppm	1000 ppm	32000 ug/M3	RSL RATL
Acrylonitrile	EPA TO-15	1 ppm	2 ppm	0.036 ug/M3	RSL RATL
Benzene	EPA TO-15	0.1 ppm	1 ppm	0.31 ug/M3	RSL RATL
Carbon Tetrachloride	EPA TO-15		10 ppm	0.41 ug/M3	RSL RATL
Chlorobenzene	EPA TO-15		75 ppm	52 ug/M3	RSL RATL
Styrene	EPA TO-15	50 ppm	100 ppm	1000 ug/M3	RSL RATL
Toluene	EPA TO-15	100 ppm	200 ppm	5200 ug/M3	RSL RATL
Vinyl Chloride	EPA TO-15	n/a	1 ppm	0.16 ug/M3	RSL RATL
Xylene	EPA TO-15	100 ppm	100 ppm	100 ug/M3	RSL RATL

RSL RATL - EPA Regional Screening Level for residential air, dated April 2012. The more conservative of the noncancer and cancer target risk levels was chosen.

Table 2. Constituents to be collected and analyzed by the landfill's contract consultant during the air monitoring program at Bridgeton Sanitary Landfill and the screening levels which trigger the need for more detailed analysis and site-specific risk assessment.

Constituent	Analytical method	NIOSH REL	OSHA PEL	Other Health Benchmark	Health Benchmark Method
0-tolualdehyde	EPA TO-11A				
1,1,1-trichloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17			5200 ug/M3	RSL RATL
1,1,2,2-tetrachloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	7 ppm	0.33 ug/M3	RSL RATL
1,1,2-trichloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17	10 ppm	10 ppm	0.15 ug/M3	RSL RATL
1,1-dichloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	100 ppm	1.5 ug/M3	RSL RATL
1,1-dichloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	100 ppm	1.5 ug/M3	RSL RATL
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA TO-9A			0.00021 ug/M3	RSL RATL
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA TO-9A			0.00021 ug/M3	RSL RATL
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	EPA TO-9A			0.0000021 ug/M3	RSL RATL
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	EPA TO-9A			0.0000021 ug/M3	RSL RATL
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	EPA TO-9A			0.0000021 ug/M3	RSL RATL
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	EPA TO-9A			0.000000064 ug/M3	RSL RATL

1,2,4-tirchlorobenzene	EPA TO-15, NIOSH 2549, or EPA TO-17	5 ppm	n/a	2.1 ug/M3	RSL RATL
1,2,4-trimethylbenzene	EPA TO-15, NIOSH 2549, or EPA TO-17	25 ppm	n/a	7.3 ug/M3	RSL RATL
1,2-dibromo-3-chloropropane	EPA TO-15, NIOSH 2549, or EPA TO-17		0.001 ppm	0.00016 ug/M3	RSL RATL
1,2-dibromomethane	EPA TO-15, NIOSH 2549, or EPA TO-17			4.2 ug/M3	RSL RATL
1,2-dichloro-1,1,2,2-tetrafluoroethane	EPA TO-15, NIOSH 2549, or EPA TO-17				
1,2-dichlorobenzene	EPA TO-15, NIOSH 2549, or EPA TO-17	50 ppm	50 ppm	210 ug/M3	RSL RATL
1,2-dichloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17			0.094 ug/M3	RSL RATL
1,2-dichloropropane	EPA TO-15, NIOSH 2549, or EPA TO-17			0.24 ug/M3	RSL RATL
1,3,5-trimethylbenzene	EPA TO-15, NIOSH 2549, or EPA TO-17	25 ppm	n/a		
1,3-butadiene	EPA TO-15, NIOSH 2549, or EPA TO-17			0.081 ug/M3	RSL RATL
1,3-dichlorobenzene	EPA TO-15, NIOSH 2549, or EPA TO-17				
1,4-dichlorobenzene	EPA TO-15, NIOSH 2549, or EPA TO-17		75 ppm	0.22 ug/M3	RSL RATL
1,4-dioxane	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	100 ppm	0.32 ug/M3	RSL RATL
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	EPA TO-9A			0.00000021 ug/M3	RSL RATL
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	EPA TO-9A			0.00000064 ug/M3	RSL RATL
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA TO-9A			0.000000064 ug/M3	RSL RATL
2,5-dimethylbenzaldehyde	EPA TO-11A				
2,5-dimethylthiophene	ASTM D5504-01				
2-Butanone (methyl-ethyl-ketone)	EPA TO-15, NIOSH 2549, or EPA TO-17	200 ppm	200 ppm	5200 ug/M3	RSL RATL
2-ethylhexanoic Acid	COL AQL Method 102				

2-ethylhexanoic acid	COL AQL Method 102				
2-ethylthiophene	ASTM D5504-01				
2-hexanone	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	100 ppm	31 ug/M3	RSL RATL
2-methyl Butanoic Acid	COL AQL Method 102				
2-methylpentanoic acid	COL AQL Method 102				
2-methylpropanioic acid	COL AQL Method 102				
2-propanol	EPA TO-15, NIOSH 2549, or EPA TO-17				
3-chloro-1-propene	EPA TO-15, NIOSH 2549, or EPA TO-17				
3-methylbenzaldehyde	EPA TO-11A				
3-methylbutanoic acid	COL AQL Method 102				
3-methylpentanoic acid	COL AQL Method 102				
3-methylthiophene	ASTM D5504-01				
4-ethyltoluene	EPA TO-15, NIOSH 2549, or EPA TO-17				
4-methyl-2-pentanone	EPA TO-15, NIOSH 2549, or EPA TO-17				
4-methylpentanoic acid	COL AQL Method 102				
Acenaphthylene	EPA TO-13A or NIOSH 5506				
Acenapthene	EPA TO-13A or NIOSH 5506				
Acetaldehyde	EPA TO-11A		200 ppm	1.1 ug/M3	RSL RATL
Acetic Acid	COL AQL Method 102	10 ppm	10 ppm		
Acetone	EPA TO-15, NIOSH 2549, or EPA TO-17	250 ppm	1000 ppm	32000 ug/M3	RSL RATL
Acetonitrile	EPA TO-15, NIOSH 2549, or EPA TO-17	20 ppm	40 ppm	63 ug/M3	RSL RATL
Acrolein	EPA TO-15, NIOSH 2549, or EPA TO-17	0.1 ppm	0.1 ppm	0.021 ug/M3	RSL RATL

Acrylonitrile	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	2 ppm	0.036 ug/M3	RSL RATL
alpha-pinene	EPA TO-15, NIOSH 2549, or EPA TO-17				
Ammonia	OSHA ID-188	25 ppm	50 ppm	100 ug/M3	RSL RATL
Anthracene	EPA TO-13A or NIOSH 5506	n/a	n/a	0.2 mg/M3	Coal tar pitch volatiles PEL
a-pinene	EPA TO-15, NIOSH 2549, or EPA TO-17				
Benzaldehyde	EPA TO-11A				
Benzene	EPA TO-15, NIOSH 2549, or EPA TO-17	0.1 ppm	1 ppm	0.31 ug/M3	RSL RATL
Benzo(a)anthracene	EPA TO-13A or NIOSH 5506				
Benzo(a)pyrene	EPA TO-13A or NIOSH 5506	0.1 mg/M3	0.2 mg/M3	0.00087 ug/M3	RSL RATL
Benzo(b)fluoranthene	EPA TO-13A or NIOSH 5506				
Benzo(g,h,i)perylene	EPA TO-13A or NIOSH 5506				
Benzo(k)fluoranthene	EPA TO-13A or NIOSH 5506				
Benzoic acid	COL AQL Method 102				
Benzyl chloride	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	1 ppm	0.05 ug/M3	RSL RATL
Bromodichloromethane	EPA TO-15, NIOSH 2549, or EPA TO-17			0.066 ug/M3	RSL RATL
Bromoform	EPA TO-15, NIOSH 2549, or EPA TO-17	0.5 ppm		2.2 ug/M3	RSL RATL
Bromomethane	EPA TO-15, NIOSH 2549, or EPA TO-17	0.5 ppm		5.2 ug/M3	RSL RATL
Butanoic (butyric) Acid	COL AQL Method 102				
Butylamine and isomers	COL AQL Method 101	5 ppm (n)	5 ppm (n)		
Butyraldehdye	EPA TO-11A				
Carbon Disulfide	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	20 ppm	730 ug/M3	RSL RATL

Carbon Monoxide (source gas only)	EPA 3C	35 ppm	50 ppm	9 ppm	CAA NAAQS
Carbon Tetrachloride	EPA TO-15, NIOSH 2549, or EPA TO-17		10 ppm	0.41 ug/M3	RSL RATL
Carbonyl Sulfide	ASTM D5504-01				
Chlorobenzene	EPA TO-15, NIOSH 2549, or EPA TO-17		75 ppm	52 ug/M3	RSL RATL
Chloroethane	EPA TO-15, NIOSH 2549, or EPA TO-17				
Chloroform	EPA TO-15, NIOSH 2549, or EPA TO-17	2 ppm	50 ppm	0.11 ug/M3	RSL RATL
Chloromethane	EPA TO-15, NIOSH 2549, or EPA TO-17			94 ug/M3	RSL RATL
Chrysene	EPA TO-13A or NIOSH 5506			0.087 ug/M3	RSL RATL
cis-1,2-dichloroethylene	EPA TO-15, NIOSH 2549, or EPA TO-17				
cis-1,3-dichloropropene	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	n/a		
Crotonaldehyde (total)	EPA TO-11A	2 ppm	2 ppm		
Cumene	EPA TO-15, NIOSH 2549, or EPA TO-17	50 ppm	50 ppm	420 ug/M3	RSL RATL
Cyclohexane	EPA TO-15, NIOSH 2549, or EPA TO-17	300 ppm	300 ppm	6300 ug/M3	RSL RATL
Cyclohexanecarboxylic acid	COL AQL Method 102				
Dibenz(a,h)anthracene	EPA TO-13A or NIOSH 5506				
Dibromochloromethane	EPA TO-15, NIOSH 2549, or EPA TO-17			0.09 ug/M3	RSL RATL
Dichlorodifluoromethane (R12)	EPA TO-15, NIOSH 2549, or EPA TO-17	1000 ppm	1000 ppm	100 ug/M3	RSL RATL
Diethyl Disulfide	ASTM D5504-01				
Diethyl Sulfide	ASTM D5504-01				
Diethylamine	COL AQL Method 101	10 ppm	25 ppm		
Diisopropylamine	COL AQL Method 101	5 ppm	5 ppm		

Dimethyl Disulfide	ASTM D5504-01				
Dimethyl sulfide	ASTM D5504-01				
Dimethylamine	COL AQL Method 101	10 ppm	10 ppm		
Dipropylamine	COL AQL Method 101				
d-limonene	EPA TO-15, NIOSH 2549, or EPA TO-17				
Ethanol	EPA TO-15, NIOSH 2549, or EPA TO-17	1000 ppm	1000 ppm		
Ethyl acetate	EPA TO-15, NIOSH 2549, or EPA TO-17	400 ppm	400 ppm		
Ethyl mercaptan	ASTM D5504-01				
Ethyl methyl sulfide	ASTM D5504-01				
Ethylamine	COL AQL Method 101	10 ppm	10 ppm		
Ethylbenzene	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	100 ppm	0.97 ug/M3	RSL RATL
Fluoranthene	EPA TO-13A or NIOSH 5506				
Fluorine	EPA TO-13A or NIOSH 5506	0.1 ppm	0.1 ppm	14 ug/M3	RSL RATL
Formaldehyde	EPA TO-11A	0.016 ppm	0.75 ppm	0.19 ug/M3	RSL RATL
Heptanoic Acid	COL AQL Method 102				
Hexachlorobutadiene	EPA TO-15, NIOSH 2549, or EPA TO-17	0.02ppm	n/a	0.11 ug/M3	RSL RATL
Hexanoic acid	COL AQL Method 102				
Hydrogen (collected from source only)	EPA 3C	n/a	n/a		
Hydrogen Cyanide	NIOSH 7904	4.7 ppm	10 ppm	0.83 ug/M3	RSL RATL
Hydrogen Sulfide	ASTM D5504-01	10 ppm	20 ppm	0.21 ug/M3	RSL RATL
Indeno(1,2,3-cd)pyrene	EPA TO-13A or NIOSH 5506				
Isobutyl mercaptan	ASTM D5504-01				
Isobutylamine	COL AQL Method 101				

Isopropyl mercaptan	ASTM D5504-01				
Isopropylamine	COL AQL Method 101		5 ppm		
Isoprpolyamine	COL AQL Method 101		5 ppm		
Isovaleraldehyde	EPA TO-11A				
m, p-tolualdehyhde	EPA TO-11A				
Mercaptan isomers	ASTM D5504-01				
Mercury (elemental)	NIOSH 6009		0.1 mg/M3	0.31 ug/M3	RSL RATL
Methane (collected from source only)	EPA 3C	n/a	n/a		
Methyl Butanoic Acid (isovaleric acid)	COL AQL Method 102				
Methyl mercaptan	ASTM D5504-01	0.5 ppm	10 ppm		
Methyl methacrylate	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	100 ppm		
Methyl Propanoic Acid	COL AQL Method 102				
Methyl tert-butyl ether	EPA TO-15, NIOSH 2549, or EPA TO-17			9.4 ug/M3	RSL RATL
Methylene chloride	EPA TO-15, NIOSH 2549, or EPA TO-17		25 ppm	96 ug/M3	RSL RATL
Methylpentanoic Acid isomers	COL AQL Method 102				
Napthalene	EPA TO-13A or NIOSH 5506	10 ppm	10 ppm	0.072 ug/M3	RSL RATL
n-butyl acetate	EPA TO-15, NIOSH 2549, or EPA TO-17	150 ppm	150 ppm		
n-butyl mercaptan	ASTM D5504-01	0.5 ppm	10 ppm		
n-heptane	EPA TO-15, NIOSH 2549, or EPA TO-17	85 ppm	500 ppm		
n-hexaldehyde	EPA TO-11A				
n-hexane	EPA TO-15, NIOSH 2549, or EPA TO-17	50 ppm	500 ppm	730 ug/M3	RSL RATL
n-nonane	EPA TO-15, NIOSH 2549, or EPA TO-17	200 ppm	n/a	210 ug/M3	RSL RATL
n-octane	EPA TO-15, NIOSH 2549, or EPA TO-17	75 ppm	500 ppm		

Nonanoic Acid	COL AQL Method 102				
n-propyl mercaptan	ASTM D5504-01				
n-propylbenzene	EPA TO-15, NIOSH 2549, or EPA TO-17			1000 ug/M3	RSL RATL
Octanoic Acid	COL AQL Method 102				
o-tolualdehyde	EPA TO-11A				
Pentanoic Acid	COL AQL Method 102				
Phenanthrene	EPA TO-13A or NIOSH 5506				
Propanoic Acid	COL AQL Method 102				
Propene	EPA TO-15, NIOSH 2549, or EPA TO-17				
Propionaldehyde	EPA TO-11A			8.3 ug/M3	RSL RATL
Propylamine	COL AQL Method 101				
Pyrene	EPA TO-13A or NIOSH 5506				
s-butylamine	COL AQL Method 101				
Styrene	EPA TO-15, NIOSH 2549, or EPA TO-17	50 ppm	100 ppm	1000 ug/M3	RSL RATL
t-butylamine	COL AQL Method 101				
tert-butyl mercaptan	ASTM D5504-01				
Tetrachloroethylene	EPA TO-15, NIOSH 2549, or EPA TO-17		100 ppm	9.4 ug/M3	RSL RATL
Tetrahydrofuran	EPA TO-15, NIOSH 2549, or EPA TO-17	200 ppm	200 ppm	2100 ug/M3	RSL RATL
Tetrahydrothiophene	ASTM D5504-01				
Thiophene	ASTM D5504-01				
Toluene	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	200 ppm	5200 ug/M3	RSL RATL
trans-1,2-dichloroethylene	EPA TO-15, NIOSH 2549, or EPA TO-17			63 ug/M3	RSL RATL

trans-1,3-dichloropropene	EPA TO-15, NIOSH 2549, or EPA TO-17	1 ppm	n/a		
Trichloroethylene	EPA TO-15, NIOSH 2549, or EPA TO-17		100 ppm	0.43 ug/M3	RSL RATL
Trichlorofluoroethane	EPA TO-15, NIOSH 2549, or EPA TO-17				
Triethylamine	COL AQL Method 101		25 ppm	7.3 ug/M3	RSL RATL
Trimethylamine	COL AQL Method 101	10 ppm	n/a		
Valeraldehyde	EPA TO-11A	10 ppm	n/a		
Vinyl acetate	EPA TO-15, NIOSH 2549, or EPA TO-17	4 ppm	n/a	210 ug/M3	RSL RATL
Vinyl Chloride	EPA TO-15, NIOSH 2549, or EPA TO-17	n/a	1 ppm	0.16 ug/M3	RSL RATL
Xylenes	EPA TO-15, NIOSH 2549, or EPA TO-17	100 ppm	100 ppm	100 ug/M3	RSL RATL

Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

December 4, 2012

David Vasbinder
Environmental Manager
BRIDGETON LANDFILL LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044

RE: WASTEWATER DISCHARGE PERMIT NO. 0511559802 - 2
For premise at: 13570 St. Charles Rock Road, Bridgeton, MO 63044

Dear Mr. Vasbinder:

Thank you for your November 13, 2012 letter regarding Action Item #1 and Progress Report of your Administrative Compliance Order (AO). We have completed our review of the information you provided. Based on this information, MSD will agree not to require installation of a full time foam suppression system at this time. Should a future foaming incident occur, then a final design and installation of the foam suppression system must proceed.

As a reminder that under Action Item #5 of the AO, BRIDGETON LANDFILL LLC must demonstrate compliance with ordinance prohibition and discharge requirements. The air moving / monitoring system at the MSD pump station is not a suitable means to show compliance, but as a failsafe if the leachate discharge is out of compliance and causes unsafe atmospheric conditions. BRIDGETON LANDFILL's leachate discharge must be in compliance at the time it is discharged to demonstrate compliance.

Thank you for helping us to comply with state and federal regulations. If you have any questions, please contact me at 314.436.8721.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Chris Bulmahn

Chris Bulmahn
Associate Engineer

cc: Doug Mendoza, MSD
Tom Boehm, MSD
Rob Daly, MSD

/DM

Doug Mendoza BRIDGETON LANDFILL

From:	Nora C. Estopare
Sent:	Tuesday, December 04, 2012 10:58 AM
To:	Lehman, Larry; Norris, Dan
Cc:	Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda; Roth-Roffy, Brian
Subject:	RE: Bridgeton Landfill Information Request
Attachments:	BRIDGETON LANDFILL LLC - order.pdf

At your request, I am forwarding a copy of the Administrative Compliance Order.

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

From: Lehman, Larry [mailto:larry.lehman@dnr.mo.gov]
Sent: Tuesday, December 04, 2012 10:01 AM
To: Nora C. Estopare; Norris, Dan
Cc: Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda; Roth-Roffy, Brian
Subject: RE: Bridgeton Landfill Information Request

Thank you Nora. The November 13, 2012 letter refers to an Administrative Compliance Order issued on October 26,2012 – can MSD provide a copy to us? Thank you.

Monday, December 10th at 1 pm will work for us. If you like, we can contact your phone number at that time unless you have a different number you prefer for us to call.

Larry Lehman
Compliance/Enforcement Section Chief
Solid Waste Management Program
Department of Natural Resources
PO Box 176
Jefferson City, MO 65102
Fax (573) 526-3902
Phone (573) 751-5401

From: Nora C. Estopare [mailto:nestopare@stlmsd.com]
Sent: Monday, December 03, 2012 1:00 PM
To: Lehman, Larry; Norris, Dan
Cc: Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda
Subject: RE: Bridgeton Landfill Information Request

Mr. Lehman and Mr. Norris,
Thank you for your response to MSD's information request. Several MSD staff have been involved with the evaluation of the odor issues we are experiencing at the pump station building that the Bridgeton Landfill discharges into. Next week is the earliest time where there is availability on the calendars of MSD staff that would like to attend our conference call. Are both of you available during any of the following times?

Doug Mendoza Bridgeton Landfill
10038030000

From: Nora C. Estopare
Sent: Monday, December 03, 2012 1:00 PM
To: Lehman, Larry; Norris, Dan
Cc: Ryan Sabourin; Christopher J. Bulmahn; Tom Boehm; Doug Mendoza; Rob G Daly; Michael Grace; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda
Subject: RE: Bridgeton Landfill Information Request
Attachments: BRIDGETON LANDFILL LLC - permit limits sheet.pdf; Sewer Use Ordinance 12559 - prohibitions & limits.pdf; BRIDGETON LANDFILL LLC - TTOs & fume toxicities oct 10,11.pdf; BRIDGETON LANDFILL LLC - fume toxicities oct 22,23.pdf

Mr. Lehman and Mr. Norris,
Thank you for your response to MSD's information request. Several MSD staff have been involved with the evaluation of the odor issues we are experiencing at the pump station building that the Bridgeton Landfill discharges into. Next week is the earliest time where there is availability on the calendars of MSD staff that would like to attend our conference call. Are both of you available during any of the following times?

- Monday, December 10th , 9am-12pm
- Monday, December 10th , 1pm-3pm
- Tuesday, December 11th , 1pm-3pm
- Thursday, December 13th , 1pm-3pm

This will also give MSD time to review all of the air monitoring results that MDNR has provided to us.

Please find attached copies of the information that you have requested in return:

- A page from Bridgeton Landfill's discharge permit that lists specific limits. The listed limits are only for those compounds for which MSD requires self-monitoring of the landfill's discharge.
- An excerpt from MSD Sewer Use Ordinance 12559. It includes discharge prohibitions and those pollutants for which MSD has specific numerical limits.
- Two letters from MSD to the Bridgeton Landfill citing exceedances of specific limits and sewer use prohibition violations or potential prohibition violations.

(Note: Total Toxic Organics (TTO) is the pollutant that is in MSD's NPDES permit, and the same one we use for our sewer use ordinance. Where we cited "potential prohibition violation" in the attached letters, it is because MSD does not directly sample and analyze the air. Rather, we sample and analyze the wastewater, and compare the results to fume toxicity screening levels.)

Best Regards,
Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

From: Lehman, Larry [mailto:larry.lehman@dnr.mo.gov]
Sent: Monday, December 03, 2012 10:07 AM
To: Nora C. Estopare; Norris, Dan
Cc: Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly; Campbell, Cecilia; Fitch, Charlene; Boessen, John; Nagel, Chris; Ardrey, Brenda
Subject: RE: Bridgeton Landfill Information Request

Thanks Nora. As you know, Dan Norris has forwarded you several documents.
In regards to a conference call, would anytime between 8:30 and 10:30 this Wednesday morning work for MSD?

Larry Lehman
Compliance/Enforcement Section Chief
Solid Waste Management Program
Department of Natural Resources
PO Box 176
Jefferson City, MO 65102
Fax (573) 526-3902
Phone (573) 751-5401

From: Nora C. Estopare [mailto:nestopare@stlmsd.com]
Sent: Friday, November 30, 2012 3:51 PM
To: Lehman, Larry; Norris, Dan
Cc: Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly
Subject: Bridgeton Landfill Information Request

Mr. Lehman,
Thank you for taking the time to speak with me on the telephone yesterday. As I indicated during our conversation, MSD would like to request a copy of all monitoring results as related to MDNR's recent sampling of the Bridgeton Landfill.

MSD operates and maintains a pump station that the Bridgeton Landfill discharges to. In the late spring months of 2012, MSD workers noted odor issues in this pump station building. High levels of methane, hydrogen sulfide, and carbon monoxide were measured with 4-gas meter equipment routinely used by MSD workers. Currently, the odor issues continue to be problematic even after ventilation and 4-gas meter equipment indicates the pump station building is safe for entry.

During October 2012, MSD conducted a special sampling effort outside of normal quarterly sampling of the Bridgeton Landfill. Water samples were collected from the 14" pipe discharging from the Bridgeton Landfill into the pump station wetwell. The analytical results are attached. The landfill has historically discharged Total Phenols at concentrations of 2-5 mg/L. The October 2012 sample results measured Total Phenols at concentrations of 38-78 mg/L.

After you have had a chance to review this information, MSD would also be interested having a conference call with yourself and Mr. Dan Norris. Please forward times when you would be available.

Best Regards,
Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

Doug Mendoza

Bridgeton Landfill
100380300

From:	Norris, Dan <dan.norris@dnr.mo.gov>
Sent:	Friday, November 30, 2012 5:41 PM
To:	Nora C. Estopare; Lehman, Larry; Campbell, Cecilia
Cc:	Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly
Subject:	RE: Bridgeton Landfill Information Request (Part 1)
Attachments:	Bridgeton Landfill Air Sampling Report 10-19-12.pdf; Bridgeton Air Sampling Map 8-2012 2.pdf; Bridgeton DNR VOC Results 8-17-12 FML.pdf; Table 1_FML_All Detects_10-5-2012 _DLG rev.pdf; Table 2_Landfill Downwind_All Detects_10-5-2012.pdf; Table 3_Upwind_All Detects_10-5-2012.pdf; Sulfur Cmpds_P1203374_ASTM5504.xls; Ammonia_P1203487 _OSHA 188.xls; Copy of P1203486_TO-11.xls; Copy of P1203491_Amines.xls; Copy of P1203506_TO15.xls; Dioxin conversions.xlsx

Nora,

We are currently in the process of evaluating the Bridgeton air monitoring results from the sampling event conducted in August and I am in the process of developing my comments. We have enlisted the help of our Air Pollution Control Program and the Department of Health and Senior Services to review the data as well. Based on our evaluation of the results, we will likely request future sampling to monitor for certain compounds as this event continues.

The sampling was conducted by Stantec, a consultant hired by Bridgeton Landfill. The sampling was conducted under constant supervision from myself and other DNR staff. DNR also collected side-by-side summa canister samples from the landfill itself to compare VOC results. Samples were collected from the source of the landfill by collecting samples from the flexible membrane HDPE liner (or FML) placed over the exterior of the landfill. Samples were also collected upwind and downwind of the landfill, and on-site at breathing level. Since MSD is connected to the source of the landfill itself, you will probably be most interested in results from the FML source itself to evaluate potential for worker exposure, though it is possible that concentrations in the leachate system could be greater than the concentrations collected from the landfill surface.

The results provided consist of a report, several tables, and about 20 spreadsheets with lab analytical results. These are attached to this e-mail and another one, due to attachment size limitations. The first several attachments should give you more of a broad understanding of the sampling, while the remainder provide specifics. I should be able to answer questions you may have.

In looking over the leachate results you provided, is there a way you can send us what their permit limits are for these compounds, for us to compare? Also, you had mentioned in your conversation with Larry issuing a notice of violation to Bridgeton for exceeding certain parameters. Could you please provide us a copy of this as well?

Thank you,

Mr. Dan Norris, Environmental Specialist
Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
573-526-3915 (Direct)
573-751-5401 (Main)

From: Nora C. Estopare [mailto:nestopare@stlmsd.com]
Sent: Friday, November 30, 2012 3:51 PM
To: Lehman, Larry; Norris, Dan

Cc: Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly
Subject: Bridgeton Landfill Information Request

Mr. Lehman,
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After you have had a chance to review this information, MSD would also be interested having a conference call with yourself and Mr. Dan Norris. Please forward times when you would be available.

Best Regards,
Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

Doug Mendoza

Bridgeton Landfill
1003803002

From:	Norris, Dan <dan.norris@dnr.mo.gov>
Sent:	Friday, November 30, 2012 6:04 PM
To:	Nora C. Estopare; Lehman, Larry; Campbell, Cecilia
Cc:	Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly
Subject:	RE: Bridgeton Landfill Information Request (Part 2)
Attachments:	Fixed Gas_P1203374_3C.XLS.XLS; P1203426_TO-13.xls.xls; Sample results matrix.xlsx.xlsx; PAHS_P1203426_TO-13.xls.xls; Sulfur Cmpds_P1203374_ASTM5504.xls.xls; Aldehydes_P1203486_TO-11.xls.xls; Amines_P1203491.xls.xls; Ammonia & Chains of Custody_P1203487.pdf.pdf; Carboxylic acids_P1203488.pdf.pdf; Cyanide_1224134-Report.pdf.pdf; Fixed Gas & Chains of Custody_P1203374.pdf.pdf; Fixed Gas & Chains of Custody_P1203396.pdf.pdf; Fixed Gas_P1203374_3C.xls.xls; Mercury_1224137-Report.pdf.pdf

Nora,

Here is the second set of attachments.

Mr. Dan Norris, Environmental Specialist
Missouri Department of Natural Resources
Solid Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176
573-526-3915 (Direct)
573-751-5401 (Main)

Bridgeton Landfill Air and Landfill Gas Sampling August 2012: Summary of Findings

Bridgeton Landfill, LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044

October 19, 2012

Stantec

MSD 024497

Stantec

Sign-Off Sheet

This document entitled *Bridgeton Landfill Air and Landfill Gas Sampling, August 2012: Summary of Findings* was prepared by Stantec Consulting Services Inc. (Stantec) at the request of Bridgeton Landfill, LLC. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by ______________________
Deborah L. Gray, Ph.D., DABT

Prepared by ______________________
John Reiter, CIH

Reviewed by ______________________
Michael B. Roznowski, CHMM

Reviewed by ______________________
Gerald R. Meyers, Principal

Executive Summary

On Thursday, August 16 and Friday, August 17, 2012, Stantec Consulting Services Inc. (Stantec) conducted an extensive study of airborne and landfill gases and vapors on and around the Bridgeton Landfill, 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The study was conducted to determine and document the presence and concentration of a large number of chemical compounds which may be present from landfill decomposition and related biological and chemical phenomena occurring or potentially occurring in the landfill. These chemical compounds may potentially contribute to odors reportedly detected by residential, commercial and industrial neighbors of the landfill property, and were also evaluated for their potential contribution to occupational and community health.

In advance of the air sampling event, Stantec and Bridgeton Landfill, LLC coordinated with the Missouri Department of Natural Resources (MDNR) to develop a sampling plan to thoroughly characterize the ambient air and landfill gas/vapor; and to answer questions posed by the interested stakeholders and members of the public. The final "Air Sampling Work Plan" (the "Work Plan"), approved by MDNR was issued August 14, 2012 and served as the basis for the sampling event.

As requested and approved by MDNR in the Work Plan, samples of air and landfill gas were analyzed for the following individual constituents and analytical groupings that are of potential concern for occupational and community health, some of which may contribute to the odor. Analytical methods selected and utilized were specified by US EPA, the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM), and methods developed by Columbia Analytical Laboratories (AQL) specifically for odor investigations. All methods were presented in the Work Plan and approved by MDNR.

- Fixed Gases: EPA 3C (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane)
- Ammonia: OSHA ID-188
- Mercury` and Compounds: NIOSH 6009
- Hydrogen Cyanide: NIOSH 6010
- Reduced Sulfur Compounds: ASTM D5504
- Volatile Organic Compounds and Tentatively Identified Compounds: EPA TO-15
- Aldehydes (Carbonyl Compounds): EPA TO-11A
- Amines (Aliphatic): AQL 101

- Carboxylic Acids: AQL 102
- Polycyclic Aromatic Hydrocarbons (PAHs): EPA TO-13A
- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans): EPA TO-9

Samples of gas from under the flexible membrane liner (FML) in the Amphitheater, Second Tier, and East Face were found to contain numerous VOCs and TICs, aldehydes, reduced sulfur compounds, carboxylic acids (none detected in the sample from the second tier), naphthalene and coal-tar pitch volatile PAHs, and PCDD/PCDF. The variability in the concentrations of specific compounds found in gas from the three FML locations may help to explain the perceptible differences in odors across the landfill.

Samples of ambient air obtained from various locations on or adjacent the landfill were found to have detectable levels of several target compounds present, but at concentrations significantly below those detected under the FML.

The analytical results for ambient air were compared to occupational standards promulgated by OSHA and guidelines developed by NIOSH and ACGIH. No constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines.

Analytical results for the ambient air samples were also compared to risk-based US EPA Regional Screening Level (RSL) concentrations for industrial and residential exposure. Of the compounds detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line, only benzene and formaldehyde were present at concentrations exceeding the respective risk-based US EPA Regional Screening Levels (RSLs) for industrial and residential exposure. The RSLs for both of these compounds are very close to the laboratory method reporting limits. Formaldehyde was not found in landfill gas and is consistent with ambient background as evidenced by similar concentrations found in the upwind samples. Although benzene was not detected in the upwind samples, it is a common constituent in ambient air from urban/industrial areas.

The likely contributors to the odor observed at off-site locations are reduced sulfur compounds (e.g., dimethyl sulfide and mercaptans) and carboxylic acids (e.g., butyric acid and valeric acid) that have extremely low odor thresholds. It should be recognized that the odors of many of the reduced sulfur compounds and carboxylic acids are perceptible to the human nose at concentrations that are well below levels that present a health risk.

The results of the extensive sampling conducted in August support the conclusion that although some landfill emissions have resulted and may result in a perceptible odor, there were no compounds at concentrations of health concern to members of the surrounding community or to the people working on the landfill.

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1.0 Introduction

On Thursday, August 16 and Friday, August 17, 2012, Stantec Consulting Services Inc. (Stantec) conducted an extensive study of airborne and landfill gases and vapors on and around the Bridgeton Landfill, 13570 St. Charles Rock Road, Bridgeton, Missouri (the landfill). The study was conducted to determine and document the presence and concentration of a large number of chemical compounds which may be present from landfill decomposition and related biological and chemical phenomena occurring or potentially occurring in the landfill. These chemical compounds may potentially contribute to odors reportedly detected by residential, commercial and industrial neighbors of the landfill property, and were also evaluated for their potential contribution to occupational and community health.

The study was planned, developed, scheduled, and directed by professional Stantec personnel from Columbus, Ohio and Mequon and Green Bay, Wisconsin, and included the expertise of a Ph.D., Board Certified Toxicologist (DABT) and a Board Certified (ABIH) Industrial Hygienist (CIH). In advance of the air sampling event, Stantec and Bridgeton Landfill, LLC coordinated with the Missouri Department of Natural Resources (MDNR) to develop a sampling plan to thoroughly characterize constituents in the ambient air and landfill gas/vapor, and answer questions posed by the interested stakeholders and members of the public. The final Air Sampling Work Plan (the "Work Plan"), as approved by MDNR was issued on August 14, 2012 and served as the basis for the sampling event.

Once the Work Plan was approved by Bridgeton Landfill, LLC and MDNR, the onsite air and landfill gas sampling tasks were conducted on August 16 and 17 by the Stantec professionals, field staff and appropriate senior staff, in cooperation with landfill management and employees, MDNR personnel, and onsite landfill contractors.

2.0 Constituents of Interest in Landfill Gas and Air

As requested and approved by MDNR in the Work Plan samples of air and landfill gas were analyzed for the following individual constituents and analytical groupings that are of potential concern for occupational and community health, some of which may contribute to the odor. The protocols for collecting samples for the analyses listed below are found in Table 1. Analytical methods selected and utilized were specified by US EPA, the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the American Society for Testing and Materials (ASTM), and methods developed by Columbia Analytical Laboratories (AQL) specifically for odor investigations. All methods were presented in the Work Plan and approved by MDNR.

- Fixed Gases: EPA 3C (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane)
- Ammonia: OSHA ID-188F
- Mercury: NIOSH 6009
- Hydrogen Cyanide: NIOSH 6010
- Reduced Sulfur Compounds: ASTM D5504
- Volatile Organic Compounds and Tentatively Identified Compounds: EPA TO-15
- Aldehydes (Carbonyl Compounds): EPA TO-11A
- Amines (Aliphatic): AQL 101
- Carboxylic Acids: AQL 102
- Polycyclic Aromatic Hydrocarbons (PAHs): EPA TO-13A
- Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans (Dioxins/Dibenzofurans): EPA TO-9

3.0 Sampling Methodology

3.1 COLLECTION OF LANDFILL GAS SAMPLES

The major objective of collecting samples from beneath the flexible membrane liner (FML) was to characterize the chemical constituents in the gas being produced from the landfill at various locations, and to evaluate that gas without interference from other sources of the same constituents, especially the motor vehicles and diesel powered equipment operating on and near the landfill. As described below, air-tight sampling ports were designed and utilized to ensure only gas from below the FML was collected.

With the exception of samples for quantification of PAHs and Dioxins/Dibenzofurans, very small volumes of gas were required and could be easily acquired through a small air-tight sampling port inserted through the FML fabric. For these "under FML" samples, the sample apparatus was connected directly to these small, barbed, air-tight ports. In order to make certain that adequate volumes of gas would be present for sample collection, "chambers" were created beneath the FML at the selected locations. The methods used to construct the chambers reflected the differences in materials underlying the FML in the three locations and accounted for the volume of air required for the analytical methods. For example, the gravel and rock beneath the FML in the Amphitheater allowed rapid accumulation and movement of gas; whereas the other two areas had less porous surfaces beneath the FML. Photograph 1 shows Stantec and MDNR personnel collecting VOC samples from one of the sampling ports. Photographs 2, 3, and 4 show high volume sampling of source gas from under the FML on the amphitheater, second tier, and East face, respectively.

Characterization of PAHs and Dioxins/Dibenzofurans require large quantities of air (or gas) that are drawn through special Polyurethane Foam (PUF) filters using a high-volume sampling pump over (generally) a 24-hour period. In order to ensure a continuous supply of gas beneath the FML for the high-volume samplers, box-like structures were constructed beneath the FML and fitted with a manifold allowing two samplers to operate simultaneously. Manifolds were fabricated in the landfill shop to facilitate the movement of gas from under the FML directly to the intake ports of the high-volume samplers. These tubing structures provided a means to draw gas directly from under the FML into the sampler with minimum interference or influence from ambient air.

The high-volume samplers require an uninterrupted AC power supply to run the pumps. Electrical power was accessible for the locations on the landfill and along the fence line. A gasoline powered generator positioned approximately 50 feet away, and downwind of the sample intake, was used to supply power to the high-volume sampler in the upwind/background locations. The generator was tended throughout the 24-hour sample period to make certain that air collection was not interrupted. Photographs 5, 6, and 7 show the apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis.

3.2 COLLECTION OF AMBIENT AIR SAMPLES

Ambient air samples were collected at "breathing zone" height by mounting the sampling apparatus and SUMMA canisters on a tower constructed of plastic milk crates so that the sample collection intake ports were approximately 3 to 6 feet above the ground surface. Photographs 8, 9, and 10 show the sample collection structures and pump assemblies. Each set of ambient air samples at each location included instruments and collection media for collection of fixed gases (hydrogen, oxygen + argon, nitrogen, carbon monoxide, carbon dioxide, methane), ammonia, mercury, hydrogen cyanide, reduced sulfur compounds, volatile organic compounds, aldehydes, amines, and carboxylic acids. All of the samples in each set were collected for approximately 3 to 5 hours, with the exception of the set of samples collected at the Amphitheater location of the landfill where the concentration of the sampled compounds was expected to be potentially greater than other ambient locations. This set of air samples from the Amphitheater was collected for approximately 2 hours. It should also be noted that air was drawn into the Tedlar™ Bags for 15-20 minutes to avoid over-inflating the bags and subsequent rupture prior to being shipped to the laboratory. In all instances, sample flow rates and sample durations were optimally selected for best analytical detection and reporting limits. Also, durations were intentionally long to provide some assurance that if the presence of compound(s) was sporadic the sample would be collecting, or running, when the compound(s) appeared.

3.3 QUALITY ASSURANCE PROCEDURES FOR SAMPLE COLLECTION

Sample quality assurance encompasses procedures used for pre-sample calibration of sampling pumps, handling of samples before, during, and after collection, post-calibration of sampling pumps; elimination of potential cross contamination, elimination of collection of interfering compounds or materials.

All sampling pumps were pre-calibrated using a BIOS Defender Model 510-M revC1 (*BIOS International, Mesa Labs, Butler, New Jersey*) mechanical/digital calibration device traceable to the National Bureau of Standards (NTIS) with representative sampling media in place for each type of sample. After sample collection, and prior to collecting the next set of samples, the pumps were post-calibrated using the same calibration device, and with the actual sample in place. Where discrepancies between pre- and post-samples were noted, the change was assumed to be linear over time, and the sample volume provided to the analytical lab and used in determining concentration was the arithmetic average of the pre- and post-calibration values (consistent with industry standard methods).

Contemporary sampling media provides little opportunity for cross-contamination or external contamination. Media does not off-gas materials that could be collected in another sample and interfere with accurate analysis or reporting. Similarly, media is well protected by its manufactured configuration at all times so that external dirt, debris, or other materials cannot be readily introduced. All media, including Tedlar™ sample bags, were virgin materials. SUMMA™ canisters were cleaned and prepared by the analytical laboratory in a manner consistent and appropriate for re-use. After sampling, samples were capped and air-tightly secured, labeled with sample location identifier letter (A through N and A/U through C/U) and pump ID letter, and placed in a plastic sealable bag which was also labeled with the sample location identifier letter. Sets of samples in sealable bags were stored in the landfill office refrigerator until shipped to the laboratory for analysis to reduce volatilization or de-adsorption from the media. In addition, all samples were shipped following laboratory guidance using overnight delivery to ensure maximum holding times were not exceeded. Proper chain-of-custody forms were used for all shipped samples.

4.0 Sampling Locations

Figure 1 shows an aerial view of the Bridgeton Landfill and immediately adjacent properties. Locations where air and landfill gas samples were collected are indicated – and were located using the GPS coordinates provided by MDNR at the time the samples were collected. All sample locations were mutually agreed upon by MDNR, Bridgeton Landfill, LLC, Stantec and on the days that the samples were collected. The sample locations on Figure 1 correspond to the GPS coordinates provided by MDNR.

4.1 LOCATIONS UNDER FML

At the request of MNDR, three areas of the landfill were investigated to characterize constituents in the gas being generated in those specific locations. The three representative locations selected jointly by MDNR, landfill personnel, and Stantec, were previously, and remain, covered with FML. As shown on Figure 1, the locations where samples of gas were collected from under the FML are designated as:

- the "Amphitheater" a relatively level area on the northwest of the landfill near the concrete batch plant;
- the "Second Tier" which is at a slightly higher elevation on the landfill than the Amphitheater; and
- the "East Face" which is a large area on the eastern slope of the landfill.

4.2 LOCATIONS ON THE LANDFILL AND DOWNWIND AT THE FENCE LINE

The three ambient air sample locations designated as "the Amphitheater", the "Summit", and "Summit Valley", were selected as representative of the active remediation area where people were working and where the odor was present. The air sample from the Amphitheater was collected at breathing zone height at the same location as the sample from under the FML also designated as Amphitheater. It was postulated that constituents present in the air at those locations would likely reflect both the air moving across the landfill property from upwind and from fugitive gas emissions from the landfill.

Six ambient air sample locations along the facility fence line were selected to capture constituents in air moving from the landfill towards off-site receptors. The odor was present at the fence line locations at the time sampling was initiated.

Ambient air sample locations designated as "Pond Center", "Pond West" and "Pond East" were along the chain-link fence that separates the landfill from the adjacent Republic Services and other commercial properties to the north north/east of the landfill that are along the southwest side of St. Charles Rock Road. The flare for the landfill gas collection system is approximately 100 feet to the north of the Pond West sampling location.

It had been reported that odors were frequently observed in the topographically low area in the southeast corner of the landfill property. Two sampling locations designated "East Fence #1" and "East Fence #2," across the construction road from the east face of the landfill where FML was being installed were selected with the concurrence of MDNR.. These two ambient air sample locations were along the chain link fence that forms the boundary between the landfill property and the Boenker Farm property to the southeast. The FML sample designated as East Face was collected approximately 500 feet to the north of East Fence #2. The ambient air sample location designated as "South Fence" was along the chain link fence in a low lying area adjacent to Boenker Lane.

4.3 UPWIND/BACKGROUND LOCATIONS

Ambient air samples designated as "Grassy Knoll Center", "Grassy Knoll West", and "Grassy Knoll North" were collected in an open grassy field in the northern portion of the landfill property. This area is on a slight rise or knoll. No odor was present on the days that the samples were collected. Air was moving from off-site across the grassy knoll towards the active areas of the landfill where construction was occurring

5.0 Analytical Results

5.1 LANDFILL GAS FROM UNDER THE FML

Table 2 presents a summary of the analytical results for all compounds detected in samples of gas from the three locations under the FML.

5.1.1 Analytes Not Detected in Any Sample

The following analytes were not detected in any of the gas samples collected from the three locations under the FML: carbon monoxide; ammonia; hydrogen cyanide; mercury; and amines. Benzo(a)pyrene and the related carcinogenic PAHs associated with incomplete combustion of organic matter were also not found in any of the gas samples.

5.1.2 Fixed Gases

The gas from under the FML in the Amphitheater was found to contain: oxygen + argon (7.68%); nitrogen (35.7%); methane (9.94%); and carbon dioxide (46.7%). Gas from under the FML on the Second Tier was found to contain: hydrogen (1.29%); oxygen + argon (7.92%); nitrogen (47.0%); methane (8.70%); and carbon dioxide (35.0%). Gas from under the FML on the East Face was found to contain: hydrogen (2.03%); oxygen + argon (8.04%); nitrogen (47.7%); methane (10.7%); and carbon dioxide (31.4%).

5.1.3 Volatile Organic Compounds

Thirty five (35) target analytes and twenty eight (28) Tentatively Identified Compounds (TICs) were found in at least one of the three samples taken from under the FML. As summarized in Table 2, it is apparent that the three FML locations had somewhat different profiles with respect to the specific compounds that were detected and the concentrations of those compounds. The following VOCs were found in all three locations: propene; tetrahydrofuran; benzene; n-heptane; toluene; n-octane; ethylbenzene; m, p- and o-xylenes; n-nonane; cumene; alpha-pinene; and d-limonene. The following TICs were found in all three locations: furan; dimethyl sulfide; and 2-methylfuran.

5.1.4 Aldehydes

Formaldehyde was not found in any of the samples collected under the FML. Acetaldehyde, propionaldehyde, butyraldehyde, o-tolualdehyde, and 2,5-dimethylbenzaldehyde were found in two samples; and isovaleraldehyde, and valeraldehyde were found in one sample.

5.1.5 Reduced Sulfur Compounds

Hydrogen sulfide was detected in the sample from under the FML on the Second Tier, and was undetected in the other two "under FML" locations. The following reduced sulfur compounds were detected in all three under FML samples: dimethyl sulfide; methyl mercaptan; ethyl mercaptan; carbon disulfide; ethyl methyl sulfide; thiophene; dimethyl disulfide; and 3-methyl thiophene. The following compounds were detected in one or two of the samples: carbonyl sulfide; isopropyl mercaptan; t-butyl mercaptan; isobutyl mercaptan; 3-methyl thiophene; 2,5-

dimethyl thiophene; and 2-ethyl thiophene. Dimethyl sulfide and dimethyl disulfide were the reduced sulfur compounds detected at the highest concentrations.

5.1.6 Carboxylic Acids

No carboxylic acid compounds were detected in the gas from under the FML on the Second Tier. All carboxylic acid target analytes were found in gas from under the FML on the Amphitheater: acetic acid; propionic acid; 2-methylpropionic acid; butanoic acid; 2-methylbutanoic acid; pentanoic acid; 3-methylpentanoic acid; 4-methylpentanoic acid; hexanoic acid; heptanoic acid; 2-ethylhexanoic acid; and octanoic acid. All of the same analytes were found in gas from under the FML on the East Face except: acetic acid; 3-methylpentanoic acid; 4-methylpentanoic acid; and octanoic acid.

5.1.7 PAHs

With the exception of fluoranthene and pyrene which were not found in gas from under the FML in the Amphitheater, the following PAHs were found in gas from under the FML in all three locations: naphthalene; acenaphthene; fluorine; phenanthrene; anthracene; fluoranthene; and pyrene. It is significant to note that benzo(a)pyrene and related carcinogenic PAHs associated with incomplete combustion of organic matter were not found in any of the samples of gas from under the FML.

5.1.8 Dioxins/Dibenzofurans

Table 3 presents the concentrations of individual PCDD and PCDF isomers measured in samples of gas from the three locations under the FML. Consistent with US EPA guidance, the detected concentrations of the individual dioxin and dibenzofuran isomers were converted to a 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) recommended by US EPA (December 2010). The TCDD TEQ concentrations for the individual isomers were added to yield a single TCDD TEQ concentration for the sample. The TCDD TEQs for gas from each of the under FML samples were: Amphitheater (1.28E-08 $\mu g/m^3$); Second Tier (1.03E-08 $\mu g/m^3$); and East Face (3.00E-08 $\mu g/m^3$).

5.2 AMBIENT AIR FROM LOCATIONS ON THE LANDFILL AND DOWNWIND AT THE FENCE LINE

As described in Section 4, (shown on Figure 1), ambient air samples were collected from three locations within the active remediation area on the landfill where a strong odor was evident. These three locations are designated as the Amphitheater, the Summit and the Summit Valley. Samples were collected at six locations along the fence line that were downwind of the active areas of the landfill and where the odor was present at the time the samples were taken. Table 4 presents a summary of the analytical results for locations on the landfill and downwind at the fence line.

5.2.1 Analytes Not Detected in Any Sample

The following analytes were not detected in any samples of air from locations on the landfill or downwind at the fence line: ammonia, hydrogen cyanide; mercury; amines; carboxylic acids;

and reduced sulfur compounds with the exception of dimethyl sulfide. Benzo(a)pyrene and the related carcinogenic PAHs associated with incomplete combustion of organic matter were also not found in any of the air samples from locations on the landfill and downwind at the fence line.

5.2.2 Fixed Gases

The sample bags for the Pond East and Pond West locations were deflated when they arrived at the analytical laboratory and consequently there are no results for these two locations. For all of the other locations on the landfill where samples for fixed gases were collected, the percentage of oxygen + argon was 21.5% and the percentage of nitrogen was 78.4 to 78.5%. Hydrogen, carbon monoxide, methane and carbon dioxide were not detected in measurable concentrations.

5.2.3 Volatile Organic Compounds

Twenty (20) Target Analyte VOCs and sixteen (16) TICs were found in low $\mu g/m^3$ concentrations in one or more of the downwind locations on the landfill. The Target Analytes detected were: propene; dichlorodifluoromethane; ethanol; acetonitrile; acetone; trichlorofluoromethane; methylene chloride; 2-butanone (methyl ethyl ketone); ethyl acetate; tetrahydrofuran; benzene; toluene; n-octane; tetrachloroethene; ethylbenzene; m,p-xylenes; o-xylene; n-nonane; alpha-pinene and d-limonene. The TICs were: furan; dimethyl sulfide; methyl acetate; 2-methylfuran; methylpropionate; ethylpropionate; methylbutyrate; ethyl butyrate; isobutene; hexamethylcyclotrisiloxane; 2-ethyl-1-hexanol; acetic acid; 2-butoxyethanol; isopentane and a C6-H10 alkene. No VOC or TIC was found at concentrations exceeding occupational exposure standards. Only benzene was present at concentrations exceeding the very conservative US EPA risk-based RSLs for residential and industrial exposure. Table 4 presents the concentrations of VOCs and TICs detected in air samples from the six downwind locations and on the landfill. US EPA RSLs, OSHA PELs, and ACGIH TLVs are presented for comparison.

It should be noted that two SUMMA™ canisters were collected from the South Fence line location because the first canister South Fence #1 lost vacuum within the first hour and was considered potentially unreliable. A second canister, designated as South Fence #2 was activated and collected air for a duration of 4 hours. The analytical results from both canisters are presented in Table 4.

5.2.4 Aldehydes

Acetaldehyde was detected in all of the samples, and was the only aldehyde detected in air samples from the Amphitheater and East Fence line locations 1 & 2. As shown on the tables, acetaldehyde was detected in the landfill and downwind samples at concentrations similar to those found in upwind samples. Acetaldehyde, formaldehyde, valeraldehyde and 2,5-dimethylbenzaldehyde were found in a number of locations at concentrations similar to those detected in the upwind samples (except valeraldehyde which was not found in the upwind samples).

5.2.5 Reduced Sulfur Compounds

Dimethyl sulfide was the only reduced sulfur compound found in air from locations on the landfill and downwind along the fence line. As noted in the discussion of fixed gases (Section 5.2.2), the sample bags for the Pond East and Pond West locations were deflated when they arrived at the analytical laboratory and consequently there are no results for these two locations.

5.2.6 PAHs

High volume samples for determination of PAHs were taken from the Summit and the downwind location designated as East Fence #1. The following PAH compounds were detected in these samples: naphthalene; acenaphthene; fluorine; phenanthrene; and pyrene (summit only). Benzo(a)pyrene and other related carcinogenic PAHs were not detected in any sample.

5.2.7 Dioxins/Dibenzofurans

High volume samples for determination of dioxins/dibenzofurans were also collected from the Summit and East Fence #1. Table 5 shows the concentrations of the individual polychlorinated dibenzo-p-dioxins and dibenzofuran (dioxins/dibenzofurans) isomers that were detected. Concsitent with the US EPA guidance, the detected concentrations of the individual dioxins and dibenzofuran isomers were converted to 2, 3, 7, 8-TCDD TEQs. The total TCDD TEQ calculated for dioxins in the sample collected at the summit was 1.49E-08 $\mu g/m^3$; and the total TCDD TEQ calculated for dioxins in the sample collected at the east fence #1 was 7.88E-09 $\mu g/m^3$.

5.3 AMBIENT AIR FROM UPWIND/BACKGROUND LOCATIONS

As described previously, background samples were collected from three specific locations in an area on the northwestern portion of the landfill property referred to as the Grassy Knoll. This area was upwind of the active remediation areas of the landfill on both August 16 and 17; and no discernible odor was present. Samples were collected for all analytical suites except for PAHs. One of the high-volume sampling units arrived from the vendor in a non-functional condition and could not be repaired until the next day when repair parts were received. Given the aggressive schedule for collecting samples and the desirable 24-hour collection time required for both the PAH and Dioxin/Dibenzofuran analytical methods, it was decided to sacrifice the PAH analysis of background air. Table 6 presents a summary of analytical results for all compounds detected in at least one upwind/background sample.

5.3.1 Analytes Not Detected in Any Sample

The following analytes were not detected in any of the samples collected from the upwind locations on the Grassy Knoll: ammonia; hydrogen cyanide; mercury; amines; carboxylic acids; and reduced sulfur compounds.

5.3.2 Fixed Gases

The sample bag from the Grassy Knoll Center collected on August 16, 2012 was deflated upon arrival at the laboratory, thus the sample was not valid. All other sample bags arrived intact and were analyzed. Hydrogen, carbon monoxide and methane were not detected in any of the upwind samples. A low concentration of carbon dioxide was reported in the August 17, 2012 sample from the Grassy Knoll West. The percentage of oxygen + argon was 21.5% in all samples; and the percentage of nitrogen was 78.4 to 78.5%.

5.3.3 Volatile Organic Compounds

Seven (7) Target Analyte VOCs were detected in one or more of the upwind samples: acetone; acetonitrile; dichlorodifluoromethane; ethyl acetate; tetrachloroethene; trichlorofluoromethane; and toluene. Six (6) TICs were detected in one or more of the upwind samples: acetic acid; ethyl butyrate; ethyl propionate; hexamethycyclotrisiloxane; and an unidentified compound with retention time of 9.41 minutes. The concentrations of all VOCs and TICs are presented by location along with corresponding US EPA RSL and occupational standard/guideline concentrations. All reported concentrations of VOCs were below US EPA RSL concentrations for both residential and industrial air.

5.3.4 Aldehydes

Three common aldehyde compounds were reported at low $\mu g/m^3$ concentrations in one or more of the upwind samples: acetaldehyde; formaldehyde; and 2, 5-dimethylbenzaldehyde. Both acetaldehyde and formaldehyde were reported at concentrations higher than the US EPA RSL concentrations for residential and industrial air. As will be further discussed in section 6.2.2, the conservative risk-based RSLs are very close to, and in some cases less than, standard laboratory method reporting limits. Consequently, it is common for detected concentrations of these two compounds to exceed screening levels.

5.3.5 Dioxins/Dibenzofurans

One high-volume sample was collected from the Grassy Knoll Center to characterize upwind/background concentrations of the polychlorinated dioxins and dibenzofurans. Consistent with US EPA guidance, the concentrations of the individual dioxin and dibenzofuran isomers were converted to 2,3,7,8-TCDD TEQs and evaluated as a single concentration of the index compound. As can be seen from Table 7, a number of Dioxin and Dibenzofuran isomers were found to be present at extremely low concentrations in the upwind sample. The TCDD TEQ concentration of 1.94E-08 $\mu g/m^3$ was consistent with the US EPA RSL for residential air (6.4E-08 $\mu g/m^3$) and less than the RSL for industrial air (3.2E-07 $\mu g/m^3$).

6.0 Discussion of Sampling Results

6.1 COMPARISON OF COMPOUNDS DETECTED BY LOCATION

6.1.1 Downwind on Landfill Compared to Gas from Under FML

The following compounds were detected in the gas samples from under the FML and the ambient air from locations on the landfill and at the downwind fence line locations, but not in the upwind samples: propene; ethanol; 2-butanone (MEK); tetrahydrofuran; benzene; n-octane; ethylbenzene; xylenes; n-nonane; alpha-pinene; d-limonene; furan; dimethyl sulfide; methyl acetate; 2-methyl furan; methyl propionate; methyl butyrate; isobutene; C7-H12 alkene; ethyl propionate; and isopentane.

6.1.2 Downwind on Landfill Compared to Upwind/Background

The compounds that were detected in both upwind air and landfill/downwind fence line locations were: dichlorodifluoromethane; acetonitrile; acetone; trichlorofluoromethane; ethyl acetate; toluene; tetrachloroethene; acetaldehyde and formaldehyde. The concentrations of each detected compound were similar among all samples. The two chlorofluorocarbon compounds (Freons), tetrachloroethene, acetaldehyde, and formaldehyde appear to be constituents in the regional air mass moving across the landfill during the times that the samples were collected.

6.2 APPLICABLE OCCUPATIONAL AND PUBLIC HEALTH STANDARDS

6.2.1 Occupational Exposure Standards

Occupational Exposure Limits (OELs) published as OSHA PELs (Permissible Exposure Limits) and ACGIH TLVs (Threshold Limit Values) are presented on Tables 4 and 6 for all constituents for which occupational exposure standards or guidelines were available. In a few instances where OSHA PELs and ACGIH TLVs have not been developed, AIHA Workplace Environmental Exposure Levels (WEEL) were applied. Note that gas from under the FML is not an exposure environment, thus no comparison is made to occupational or risk-based concentrations.

ACGIH TLVs are health-based values, and refer to concentrations of chemical substances and represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. OSHA PELs are based on 1969 TLVs with the exception that some have been updated as substance specific standards to reflect more current toxicological data and research. AIHA WEELs are also similar to TVLs and have been developed for compounds for which there are no TLVs or PELs but for which AIHA believes there is significant potential workplace exposure.

The concentrations of all detected compounds in ambient air on the landfill, downwind at the fence line and upwind were low, well below occupational exposure limits. In fact, no constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines. The highest concentration of compounds compared to their respective OELs were benzene in the Pond West sample, dimethyl sulfide in the Summit Valley sample, and formaldehyde in the Pond Center, Pond East, Pond West, and Summit samples. These compounds were detected in concentrations less than 2% of their OEL Most detected sample concentrations were below 0.01% of their OELs.

As a special case, a unique TLV for VOCs that may cause similar toxicological effects was developed. It is an additive TLV based on the sum of all of the detected concentrations divided by its respective TVL; this sum is compared to one (1). The highest VOC mixture exposure was 1% of the mixture TLV, in the Pond West sample. This is well below the mixture TLV even with a 20% addition to account for detected compounds that may cause similar toxicological effects as the other detected VOCs, but that have no OELs.

It is clear that detected concentrations of the significant number and variety of compounds collected in ambient air samples on and around the landfill are well below applicable occupational exposure limits. In addition, concentrations and exposures to mixtures of the detected volatile organic compounds (presumed additive synergist relationship) are well below the mixture TLV. Total adjusted concentrations of dioxin and furan compounds are also well below the OEL and RSLs.

6.2.2 Risk-Based Screening Levels

US EPA risk-based Regional Screening Level (RSL) concentrations for exposure to constituents in air in residential and industrial settings are presented on Tables 4 and 6. RSLs for carcinogenic chemicals are derived to correspond to an excess lifetime cancer risk of 1 in 1,000,000 (1 in 1 million or 1E-06) for a person (receptor) who is assumed to be exposed to that concentration on an ongoing basis over an extended period of time (25 years for industrial and 30 years for residential). RSLs for chemicals that produce adverse non-cancer effects are concentrations that are very unlikely to produce health effects in people who are exposed over many years. Concentrations of constituents below applicable RSL concentrations are generally not considered to be of concern for public health. Concentrations above RSLs do not necessarily mean that adverse health effects will occur, but do indicate that additional evaluation may be appropriate.

The vast majority of detections were much lower than the RSL concentrations. However, the concentrations of benzene found in air from all three of the downwind fence line locations along the Pond, East Fence line #1, and South Fence line #1 and 2; and on the landfill at the Amphitheater and Summit Valley locations were higher than the conservative RSL for residential exposure (0.31 µg/m^3), with detected concentrations ranging from 1.5 up to 16 µg/m^3 The highest concentrations of benzene were found in the three Pond West, Pond Center and Pond east samples. Benzene was not detected in the air at the Summit or at the downwind East Fence line #2 location. The concentrations of benzene found in the air on the Amphitheater (1.1 µg/m^3) and the downwind East Fence line #1 location (1.5 µg/m^3) were similar to the RSL for industrial exposure (1.6 µg/m^3). It is not uncommon to find concentrations of benzene exceeding the conservative RSLs in air samples in urban/industrial settings.

All concentrations of formaldehyde found in upwind locations and in samples from locations on the landfill and the downwind fence line locations were greater than the RSL concentrations; as were the majority of the acetaldehyde concentrations, As indicated previously, the residential and industrial RSLs for formaldehyde (0.19 and 0.94 μg/m^3) and acetaldehyde (1.1 and 5.6 μg/m^3) μg/m^3), are close to the laboratory MRLs for these compounds in ambient air (0.32 – 0.70 μg/m^3). Acetaldehyde and formaldehyde have a number of common sources such as motor vehicle emissions and are frequently found in ambient air in urban settings.

6.3 ODOR THRESHOLDS

Table 8 presents the lowest published odor threshold for constituents found in gas from under the FML in comparison to the range of concentrations found in ambient air from locations on the landfill and downwind at the fence line. The odor threshold concentrations were obtained from US EPA (1992), Ruth (1986), and AIHA (1997). The characterization of the odor for each individual compound is the description used in the source reference for the odor concentration. The range of concentrations at which people can begin to recognize the distinctive odor of a chemical are frequently associated with occupational environments. For the majority of chemicals, most people can recognize a characteristic odor at concentrations well below concentrations that are of concern for health. The odor descriptions for the individual compounds are not intended to describe the odor associated with Bridgeton Landfill.

As indicated on Table 8, the lowest published odor threshold is near or below the laboratory Method Reporting Limits for the ambient air samples for the following compounds present in gas from under the FML: ethyl acetate; acetaldehyde; hydrogen sulfide; dimethyl sulfide; dimethyl disulfide; methyl mercaptan; ethyl mercaptan; isopropyl mercaptan; t-butyl mercaptan; isobutyl mercaptan; n-butyl mercaptan; thiophene; butanoic (butyric) acid; and pentanoic (valeric) acid.

The reduced sulfur compounds as a group have odors that are commonly described as "rotten eggs", "decayed cabbage", "sulfide-like", and "disagreeable". Mercaptans can be perceived at such low concentrations that they are added to natural gas as odorants to warn of gas-leaks.

As mentioned previously, the majority of the Tedlar™ bags for the ambient samples were deflated upon arrival at the analytical laboratory, although they were intact when shipped from the landfill office. Consequently, there is little data for reduced sulfur compounds. Dimethyl sulfide was the only sulfur compound detected in the usable ambient air samples from locations on the landfill. Dimethyl sulfide and dimethyl disulfide were the two sulfur compounds found at the highest concentrations in the samples of gas from under the FML. Because the odor thresholds for many of the reduced sulfur compounds are below laboratory MRLs, it is not unreasonable to assume that other reduced sulfur compounds found in gas samples from under the FML may also be present in ambient air. It is very likely that reduced sulfur compounds were significant contributors to the odor.

The carboxylic acids as a group have odors that are commonly described as "sour", "perspiration", "body odor", and "cheesy". A number of carboxylic acids were found in gas from under the FML from the amphitheater and the east face, but not the second tier, with the greatest number of individual compounds and highest concentrations detected in the sample from the amphitheater. Although no carboxylic acids were detected in the air samples from locations on the landfill and the downwind fence line, it is reasonable to assume that low concentrations of some of these compounds may have been presented and contributed to the odor.

The concentrations of the individual VOCs found in ambient air samples from locations on the landfill and downwind at the fence line are lower than the range of corresponding odor thresholds. However, the aggregate of VOCs present in the downwind locations may have contributed to the perception of odor.

The very low concentrations of naphthalene, related coal-tar pitch volatile PAHs, and Dioxins/Dibenzofurans found in the ambient air samples are not contributors to the odor. The low concentrations of aldehydes are consistent with background and are not related to the odor.

7.0 Summary and Conclusions

Samples of gas from under the FML in the Amphitheater, Second Tier, and East Face were found to contain numerous VOCs and TICs, aldehydes, reduced sulfur compounds, carboxylic acids (none detected in the sample from the second tier), naphthalene and coal-tar pitch volatile PAHs, and Dioxins/Dibenzofurans. The differences in the concentrations of specific compounds found in gas from the three FML locations may help to explain the perceptible differences in odors across the landfill.

It is not appropriate to compare the concentrations of constituents found in samples of gas from under the FML with occupational exposure standards or risk-based screening levels because the area below FML is not an exposure environment. FOR GENERAL PUBLIC

No constituent detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line exceeded or even approached applicable occupational standards or guidelines established by the Occupational Safety and Health Administration (OSHA), the National Institutes for Occupational Safety and Health (NIOSH), or the American Council of Governmental and Industrial Hygienists (ACGIH).

Of those compounds detected in samples of ambient air from locations on the active areas of the landfill and downwind at the fence line, only benzene, acetaldehdye ,and formaldehyde were present at concentrations exceeding the respective risk-based US EPA RSLs for industrial and residential exposure. The RSLs for these compounds are very close to the laboratory method reporting limits. Formaldehyde was not found in landfill gas and is consistent with ambient background as evidenced by the presence of this compound in the upwind air samples. The concentrations of acetaldehyde found in samples from locations on the landfill and downwind at the fence line were similar to the concentrations found in the upwind samples. Benzene, formaldehyde and acetaldehyde are frequently detected at low concentrations in ambient air in urban/industrial areas. These compounds have a number of common sources such as motor vehicle emissions.

The downwind fence line sample locations were very close to the areas of the landfill where FML was being installed to control gas emissions. Thus the downwind fence line samples represent the maximum concentrations of constituents moving from the landfill towards off-site receptors at the time the samples were collected. The concentrations of potentially landfill-related constituents in air at the Boenker Farm and in the surrounding neighborhood are not known, but are expected to decrease with increasing distance from the landfill.

The likely contributors to the odor observed at off-site locations are reduced sulfur compounds (e.g., dimethyl sulfide and mercaptans) and carboxylic acids (e.g., butyric acid and valeric acid) that have extremely low odor thresholds. As discussed in section 6.3, the individual members of these two groups of compounds have been described as having odors that many people find objectionable. However, the majority of these odorous compounds are of low order of toxicity.

The results of the extensive sampling conducted in August support the conclusion that although there was an odor, there are no compounds in the fugitive emissions from the landfill at concentrations of health concern to members of the surrounding community or to the people working on the landfill.

8.0 Tables, Figures, Photographs

Table 1. Sample collection protocols

Table 2. Summary of analytical results for all compounds detected under the FML

Table 3. Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML

Table 4. Summary of analytical results for all compounds detected in ambient air samples from the downwind locations and on the landfill

Table 5. Individual polychlorinated dibenzo-p-dioxin and dibenzofurans (PCDD/PCDF) isomers and conversion to 2,3,7,8-TCDD toxicity equivalents (TEQs); on landfill and downwind

Table 6. Summary of analytical results for all compounds detected in at least one upwind/background sample

Table 7. Individual polychlorinated dibenzo-p-dioxin and dibenzofurans (PCDD/PCDF) isomers and conversion to 2,3,7,8-TCDD toxicity equivalents (TEQs); in upwind samples

Table 8. Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

Figure1. Air Sampling Locations

Photographs

9.0 References

American Industrial Hygiene Association, *Odor Thresholds for Chemicals with Established Occupational Health Standards, 1997 edition.*

Ruth, J.H., *Odor Thresholds and Irritation Levels of Several Chemical Substances: A Review,* Am. Ind. Hyg. J., 47: A-142 through A-151, March 1986.

US EPA, *Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990, EPA/600/R-92/047, March 1992.*

US EPA Regional Screening Levels Summary Table, April/May 2012 on-line

Occupational Safety and Health Administration (OSHA), *29CFR1910.1000, Occupational Safety and Health Standards, Subpart Z – Toxic and Hazardous Substances, Table Z-1 Limits for Air Contaminants* (also includes Table Z-1-A, Z-2, and Z-3)

American Conference of Governmental Industrial Hygienists (ACGIH), *TLVs® and BEIs® Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices,* 2012 & 2013 edition

American Industrial Hygiene Association (AIHA), *Workplace Environmental Exposure Limits (WEELs),* 2012 edition

TOXNET, *Toxicology Data Network*, US National Library of Medicine, Sep 2012 on-line

Tables

Table 1

Sample collection protocols

Bridgeton Landfill

Analyte group	*Sample location*	*Analytical method*	*Collection method*	*Sample duration and flow rate*	*Link to methodology*
Volatile organic compounds	Source and under FML[1]	EPA[3] TO-15	1 Liter Summa canisters	<30 sec, <30 sec total evacuation time by regulator	http://www.cdc.gov/niosh/docs/2003-154/pdfs/2549.pdf
	Ambient[2] on landfill and off landfill	EPA TO-15	6 Liter Summa canisters	240 min, 240 minute total evacuation time by regulator	http://www.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf
Reduced sulfur compounds	Source and under FML	ASTM[4] D5504	1 liter Tedlar[5] bag, partial fill	Low flow sampling pump; max. 10-15 min @ 0.050 lpm[6]	http://www.astm.org/Standards/D5504.htm
	Ambient on landfill and off landfill	ASTM D5504	20 liter Tedlar bag, partial fill	Low flow sampling pump; 240 min @ 0.050 lpm	http://www.caslab.com/Forms-Downloads/Flyers/REDUCED_SULFUR_BROCHURE.pdf
Carboxylic acids	Source and under FML	Columbia Analytical AQL Method 102	Treated silica gel sorbent tube	Low flow sampling pump; max. 15 min @ 1.0 lpm	http://www.caslab.com/Forms-Downloads/Flyers/CARBOXYLIC_SAMPLING_FLYER.pdf
	Ambient on landfill and off landfill	Columbia Analytical AQL Method 102	Treated silica gel sorbent tube	Low flow sampling pump; 240 min @ 0.40 lpm	
Amines	Source and under FML	Columbia Analytical AQL Method 101	Specially treated sorbent tube	Low flow sampling pump; max. 15 min @ 1.0 lpm	http://www.caslab.com/Forms-Downloads/Flyers/AMINES_METHOD_101_FLYER.pdf
	Ambient on landfill and off landfill	Columbia Analytical AQL Method 101	Specially treated sorbent tube	Low flow sampling pump; 240 min @ 0.40 lpm	
Ammonia	Source and under FML	OSHA[7] ID-188	Carbon beads	Low flow sampling pump; max. 15 min @ 0.50 lpm	http://www.osha.gov/dts/sltc/methods/inorganic/id188/id188.html
	Ambient on landfill and off landfill	OSHA ID-188	Carbon beads	Low flow sampling pump; 240 min @ 0.50 lpm	
Aldehydes	Source and under FML	EPA TO-11A	2,4-DNPH[8] coated sorbent tube	Low flow sampling pump; max. 30 min @ 1.2 lpm	http://www.epa.gov/ttnamti1/files/ambient/airtox/to-11ar.pdf
	Ambient on landfill and off landfill	EPA TO-11A	2,4-DNPH coated sorbent tube	Low flow sampling pump; 240 min @ 1.2 lpm	
Dioxins and furans	Source and under FML	EPA TO-9	High volume sample, PUF[9] sorbent	High volume pump; 24 hours @ >200 LPM	http://www.epa.gov/ttnamti1/files/ambient/airtox/to-9arr.pdf
	Ambient on landfill and off landfill	EPA TO-9	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	
Polynuclear aromatic hydrocarbons	Source and under FML	EPA TO-13A	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	http://www.epa.gov/ttnamti1/files/ambient/airtox/to-13arr.pdf
	Ambient on landfill and off landfill	EPA TO-13A	High volume sample, PUF sorbent	High volume pump; 24 hours @ >200 LPM	

Table 1

Sample collection protocols

Bridgeton Landfill

Analyte group	*Sample location*	*Analytical method*	*Collection method*	*Sample duration and flow rate*	*Link to methodology*
Hydrogen cyanide	Source and under FML	NIOSH[10] 6010	Soda lime sorbent tube	Low flow sampling pump; max. 15 min @ 0.05 lpm	http://www.cdc.gov/niosh/docs/2003-154/pdfs/6010.pdf
	Ambient on landfill and off landfill	NIOSH 6010	Soda lime sorbent tube	Low flow sampling pump; 240 min @ 0.04 lpm	
Mercury compounds	Source and under FML	NIOSH 6009	Anasorb sorbent tube	Low flow sampling pump; max. 30 min @ 0.20 lpm	http://www.cdc.gov/niosh/docs/2003-154/pdfs/6009.pdf
	Ambient on landfill and off landfill	NIOSH 6009	Anasorb sorbent tube	Low flow sampling pump; 240 min @ 0.20 lpm	
Fixed gases (hydrogen, methane, carbon monoxide, carbon dioxide)	Source and under FML	EPA Method 3C	1 liter Tedlar bag, partial fill	Low flow sampling pump; max. 10-15 min @ 0.050 lpm	http://www.epa.gov/ttn/emc/promgate/m-03c.pdf
	Ambient on landfill and off landfill	EPA Method 3C	20 liter Tedlar bag, partial fill	Low flow sampling pump; 240 min @ 0.050 lpm	

Footnotes

1) FML - flexible membrane liner covering specific areas of the surface of the landfill
2) Ambient - ambient air samples are collected in open air, as opposed to from sources such as under the FML
3) EPA - U.S. Environmental Protection Agency
4) ASTM - American Society for Testing Materials
5) Tedlar - trademarked flexible material used for sample collection bags; impervious to small molecular weight gases and vapors for known periods of time (holding times)
6) LPM - liters per minute
7) OSHA - U.S. Occupational Safety and Health Administration
8) 2,4-DNPH - 2,4-dinitrophenylhydrazine
9) PUF - polyurethane foam
10) NIOSH - U.S. National Institute of Occupational Safety and Health

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Amphitheater		Second Tier		East Face	
	Concentrations in µg/m³[2]					
	Stantec	*MDNR[3]*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Volatile Organic Compounds						
Propene	27,000	22,546	95,000	168,919	37,000	74,332
Chloromethane	ND[4]		ND		2,700	
1,3-Butadiene	590		ND		ND	
Chloroethane	ND		5600		ND	
Ethanol	99,000		ND		ND	
Acetone	500,000	672,255	ND	91,455	72,000	124,712
2-Propanol	60,000		ND		ND	
2-Butanone (MEK)	340,000		ND		89,000	
Ethyl acetate	4,800		ND		ND	
n-Hexane	2,100		ND		2,900	
Tetrahydrofuran	170,000	180,816	39,000	ND	70,000	62,828
Benzene	120,000	130,663	620,000	837,007	390,000	450,450
Cyclohexane	1,100		ND		ND	
1,4-Dioxane	4,100		ND		ND	
n-Heptane	3,200		8,000		3,300	
4-methyl-2-pentanone	30,000	20,565	ND	ND	16,000	16,181
Toluene	43,000	44,845	100,000	128,129	48,000	73,109
2-Hexanone	11,000		ND		3,100	
n-Butyl acetate	12,000		ND		ND	
n-Octane	9,500		17,000		13,000	
Chlorobenzene	3,000		ND		ND	
Ethylbenzene	27,000	38,700	32,000	42,942	22,000	29,699

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Amphitheater		Second Tier		East Face	
	Concentrations in µg/m³[2]					
	Stantec	*MDNR[3]*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
m,p-Xylenes	57,000	39,511	37,000	31,566	40,000	34,475
0-Xylene	20,000	13,460	12,000	18,106	16,000	24,836
Styrene	1,200		ND		ND	
n-Nonane	16,000		17,000		9,000	
Cumene	6,000		5,200		4,300	
Alpha-Pinene	12,000		53,000		16,000	
n-Propylbenzene	3,800		ND		2,200	
4-Ethyltoluene	4,900		ND		2,900	
1,3,5-Trimethylbenzene	6,700		ND		3,500	
1,2,4-Trimethylbenzene	19,000	23,989	ND	ND	8,300	19,466
1,4-Dichlorobenzene	10,000		ND		3,200	
d-Limonene	22,000		22,000		21,000	
Naphthalene	510		ND		ND	
Tentatively Identified Compounds						
Furan	46,000		120,000		300,000	
Dimethyl sulfide	68,000		83,000		280,000	
Methyl acetate	44,000		ND		ND	
2-Methylfuran	68,000		380,000		240,000	
Methyl propionate	45,000		ND		ND	
1-Butanol	73,000		ND		ND	
2-Pentanone	59,000		ND		ND	
Methyl butyrate	110,000		ND		ND	
Dimethyl disulfide	70,000		ND		42,000	

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Concentrations in µg/m³[2]					
	Amphitheater		*Second Tier*		*East Face*	
	Stantec	*MDNR*[3]	*Stantec*	*MDNR*	*Stantec*	*MDNR*
2-Methyl cyclopentanone	51,000		ND		ND	
Methyl hexanoate	43,000		ND		ND	
2-Ethyl cyclopentanone	41,000		ND		ND	
n-Decane	40,000		ND		ND	
p-Isopropyltoluene	120,000		ND		42,000	
n-Undecane	46,000		ND		ND	
Dimethyl ether	ND		120,000		ND	
Isobutene	ND		140,000		85,000	
n-Butane	ND		41,000		35,000	
C4-H8 Alkene (5.51 RT)	ND		83,000		33,000	
C4-H8 Alkene (5.80 RT)	ND		90,000		34,000	
Isopentene	ND		42,000		ND	
Cyclopentene	ND		41,000		33,000	
C6-H10 Alkene (13.0 RT)	ND		110,000		74,000	
C10-H12 Alkene (14.58 RT)	ND		92,000		71,000	
C10-H12 Alkene (14.63 RT)	ND		110,000		93,000	
3-Methyl-3-heptene	ND		27,000		29,000	
C8-H14 Alkene (16.96 RT)	ND		22,000		ND	
C8-H14 Alkene (16.89 RT)	ND		ND		31,000	
Aldehydes						
Formaldehyde	ND		ND		ND	
Acetaldehyde	1,200		ND		350	
Propionaldehyde	660		ND		140	

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Amphitheater		Second Tier		East Face	
	Concentrations in µg/m³[2]					
	Stantec	*MDNR*[3]	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Butyraldehyde	3,000		ND		1,500	
Benzaldehyde	2,300		140		990	
Isovaleraldehyde	ND		120		ND	
Valeraldehyde	ND		1,200		ND	
o-Tolualdehyde	ND		340		92	
2,5-Dimethyl-benzaldehyde	720		ND		960	
Reduced Sulfur Compounds						
Hydrogen sulfide	ND		27		ND	
Carbonyl sulfide	ND		150		150	
Methyl mercaptan	490		4,000		260	
Ethyl mercaptan	460		130		17	
Dimethyl sulfide	240,000		600,000		570,000	
Carbon disulfide	190		180		2,300	
Isopropyl mercaptan	210		170		ND	
t-Butyl mercaptan	380		29		ND	
Ethyl methyl sulfide	12,000		4,000		5,100	
Thiophene	11,000		5,000		19,000	
Isobutyl mercaptan	ND		420		ND	
n-Butyl mercaptan	2,100		710		1,400	
Dimethyl disulfide	4,100		20,000		54,000	
3-Methylthiophene	840		330		900	
Tetrahydrothiophene	ND		210		380	
2,5-Dimethylthiophene	ND		ND		800	

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Concentrations in µg/m3[2]					
	Amphitheater		Second Tier		East Face	
	Stantec	*MDNR*[3]	*Stantec*	*MDNR*	*Stantec*	*MDNR*
2-Ethylthiophene	ND		ND		840	
Carboxylic Acids						
Acetic Acid	11,000		ND		ND	
Propionic Acid	13,000		ND		9,200	
2-Methylpropionic Acid	12,000		ND		13,000	
Butanoic Acid	56,000		ND		41,000	
3-Methylbutanoic Acid	11,000		ND		9,000	
Pentanoic Acid	23,000		ND		3,800	
3-Methylpentanoic Acid	610		ND		ND	
4-Methylpentanoic Acid	1,100		ND		ND	
Hexanoic Acid	53,000		ND		1,200	
Heptanoic Acid	2,900		ND		ND	
2-Ethylhexanoic Acid	4,800		ND		1,800	
Octanoic Acid	690		ND		ND	
PAHs						
Naphthalene	35		7.9		13	
Acenaphthene	4.5		0.23		0.22	
Fluorene	3.4		0.2		0.18	
Phenanthrene	0.21		0.44		0.19	
Anthracene	0.19		0.022		0.041	
Fluoranthene	ND		0.019		0.026	
Pyrene	ND		0.021		0.016	

Table 2

Summary of analytical results for all compounds detected under the FML[1]

Bridgeton Landfill

Compounds/analytes	Concentrations in $\mu g/m^3$[2]					
	Amphitheater		Second Tier		East Face	
	Stantec	MDNR[3]	Stantec	MDNR	Stantec	MDNR
TCDD TEQ	1.52E-08		1.03E-08		3.00E-08	

Footnotes

1) FML - flexible membrane liner covering specific areas of the surface of the landfill
2) $\mu g/m^3$ - micrograms per cubic meter
3) Missouri Department of Natural Resources
4) ND - not detected
5) Refer to Figure 1, Location of Samples, for location descriptions

Table 3

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML[1]

Bridgeton Landfill

ID[2]	Sample #	Date collected	Location/description	2,3,7,8-TCDD (µg/m3)	1,2,3,7,8-PeCDD (µg/m3)	1,2,3,4,7,8-HxCDD (µg/m3)	1,2,3,6,7,8-HxCDD (µg/m3)	1,2,3,7,8,9-HxCDD (µg/m3)	1,2,3,4,6,7,8-HpCDD (µg/m3)	OCDD (µg/m3)	2,3,7,8-TCDF (µg/m3)
A/U	1425	8/17/2012	Amphitheater, under FML	ND[3]	ND	ND	ND	8.74E-09	8.14E-08	5.07E-07	2.34E-08
B/U	1422	8/17/2012	Second Tier of LF, under FML	ND	ND	ND	ND	ND	4.58E-08	1.61E-07	ND
C/U	1423	8/17/2012	East Face of Landfill, under FML	1.76E-08	ND	ND	ND	3.49E-08	6.11E-08	ND	1.53E-08

ID	Sample #	Date collected	Location/description	2,3,4,7,8-PeCDF (µg/m3)	1,2,3,4,7,8-HxCDF)µg/m3)	1,2,3,6,7,8-HxCDF (µg/m3)	1,2,3,7,8,9-HxCDF (µg/m3)	2,3,4,6,7,8-HxCDF (µg/m3)	1,2,3,4,6,7,8-HpCDF (µg/m3)	1,2,3,4,7,8,9-HpCDF (µg/m3)	OCDF
A/U	1425	8/17/2012	Amphitheater, under FML	1.41E-08	3.56E-08	1.53E-08	ND	ND	1.21E-07	ND	3.65E-07
B/U	1422	8/17/2012	Second Tier of LF, under FML	1.22E-08	3.41E-08	1.19E-08	ND	ND	9.90E-08	ND	4.23E-07
C/U	1423	8/17/2012	East Face of Landfill, under FML	ND	2.98E-08	1.57E-08	ND	ND	1.44E-07	ND	1.25E-06

ID	Sample #	Date collected	Location/description	Total Tetra-dioxins	Total Penta-dioxins	Total Hexa-dioxins	Total Hepta-dioxins	Total Tetra-furans	Total Penta-furans	Total Hexa-furans	Total Hepta-furans
A/U	1425	8/17/2012	Amphitheater, under FML	ND	8.57E-09	1.93E-08	8.14E-08	ND	3.76E-08	5.66E-08	1.21E-07
B/U	1422	8/17/2012	Second Tier of LF, under FML	ND	ND	ND	1.34E-07	ND	2.94E-08	6.16E-08	1.47E-07
C/U	1423	8/17/2012	East Face of Landfill, under FML	ND	ND	3.49E-08	1.22E-07	2.93E-08	3.18E-08	5.87E-08	ND

Footnotes

1) FML - flexible membrane liner covering specific areas of the surface of the landfill
2) ID is common location identifier. Each sample location is assigned a unique letter or combinaton of letters
3) ND - not detected

Table 3

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) detected under the FML[1]

Bridgeton Landfill

ID[2]	*Sample #*	*Date collected*	*Location/description*	*1,2,3,7,8-PeCDF (µg/m3)*
A/U	1425	8/17/2012	Amphitheater, under FML	1.43E-08
B/U	1422	8/17/2012	Second Tier of LF, under FML	1.54E-08
C/U	1423	8/17/2012	East Face of Landfill, under FML	1.29E-08

ID	*Sample #*	*Date collected*	*Location/description*
A/U	1425	8/17/2012	Amphitheater, under FML
B/U	1422	8/17/2012	Second Tier of LF, under FML
C/U	1423	8/17/2012	East Face of Landfill, under FML

ID	*Sample #*	*Date collected*	*Location/description*
A/U	1425	8/17/2012	Amphitheater, under FML
B/U	1422	8/17/2012	Second Tier of LF, under FML
C/U	1423	8/17/2012	East Face of Landfill, under FML

Footnotes

1) FML - flexible membrane liner covering spe

2) ID is common location identifier. Each sam

3) ND - not detected

Table 4

Summary of analytical results for all compounds detected in ambient air [1] samples from the downwind locations and on the landfill

Bridgeton Landfill

Compounds/analytes	*RSL ind.* [2]	*RSL Res.* [3]	*OSHA PEL* [4]	*ACGIH TLV* [5]	*Pond Center*	*Pond East*	*Pond West*	*Summit*	*Amphi-theater*	*East Fenceline #1*	*East Fenceline #2*	*South Fenceline #1*	*South Fenceline #2*	*Summit valley*
					Concentrations in µg/m^3 [6]									
Volatile organic compounds														
Propene	13,000	3,100	——	8.61E+05	1.6	1.8	2	ND[7]	ND	1.8	1.1	0.86	2.2	1.8
Dichlorofluoromethane	440	100	4.21E+06	4.21E+04	2.2	2.7	2.3	2.2	2.1	2.2	2.2	0.86	2.2	1.8
Ethanol	140,000	32,000	1.88E+06	1.88E+06	ND	ND	ND	ND	16	ND	12	ND	ND	8.5
Acetonitrile	260	63	6.72E+04	3.36E+04	0.82	ND	ND	ND	0.76	0.88	14	ND	1.9	ND
Acetone	140,000	32,000	2.38E+06	1.19E+06	17	18	13	13	14	11	ND	8.9	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.2	1.4	1.3	1.3	1.1	1.1	1.1	1.1	ND	1.1
Methylene chloride	1,200	96	8.68E+04	1.74E+05	ND	ND	ND	ND	ND	0.94	0.79	ND	2.1	0.88
2-Butanone (MEK)	22,000	5,200	5.90E+05	5.90E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	17	5	8.7	8	3.1	ND	ND	ND	ND	1.6
Tetrahydrofuran	8,800	2,100	5.90E+05	1.47E+05	2.7	2.6	3	ND	ND	2.5	1.2	ND	2	4.7
Benzene	1.6	0.31	3.19E+03	1.60E+03	10	10	16	ND	1.1	11	ND	1.5	6.1	6.2
Toluene	22,000	5,200	7.54E+05	7.54E+04	3.7	3.3	3.4	1.7	1.6	2	ND	1.1	2.6	1.6
n-Octane	NA	NA	2.34E+06	1.40E+06	ND	ND	0.98	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND
Ethylbenzene	4.9	0.97	4.34E+05	8.68E+04	0.72	0.83	0.91	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	440	100	4.34E+05	4.34E+05	1.5	1.7	3.2	ND	ND	ND	ND	ND	ND	ND
0-Xylene	440	100	4.34E+05	4.34E+05	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND
n-Nonane	880	210	1.05E+06	1.05E+06	ND	ND	0.87	ND	ND	ND	ND	ND	ND	ND
Alpha-Pinene	NA	NA	5.57E+05	1.11E+05	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND
d-Limonene	NA	NA	1.67E+05 (AIHA WEEL[8])		0.99	ND	ND	ND	ND	ND	ND	ND	ND	ND

MSD 024533

Table 4

Summary of analytical results for all compounds detected in ambient air [1] samples from the downwind locations and on the landfill
Bridgeton Landfill

Compounds/analytes	RSL ind. [2]	RSL Res. [3]	OSHA PEL [4]	ACGIH TLV [5]	Pond Center	Pond East	Pond West	Summit	Amphi-theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit valley
					Concentrations in µg/m³ [6]									
Tentatively Identified Compounds														
Furan	NA	NA	——	——	3.4	4.7	ND	ND	ND	3.5	ND	ND	ND	13
Dimethyl sulfide	NA	NA	——	2.54E+04	4.5	4.4	2.8	ND	ND	5.2	ND	ND	ND	12
Methyl acetate	NA	NA	6.06E+05	6.06E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
2-Methylfuran	NA	NA	——	——	3.7	5.4	ND	ND	ND	3.9	ND	ND	ND	14
Methyl propionate	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5
Methyl butyrate	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	12
Isobutene	NA	NA	——	——	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND
C6-H10 Alkene (13.0 RT)	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6
Unidentified (9.41 RT)	NA	NA	——	——	4.1	4	3.3	ND	ND	3.1	ND	ND	ND	ND
Ethyl propionate	NA	NA	——	——	14	7.1	11	9.9	4.1	ND	ND	ND	ND	ND
Ethyl butyrate	NA	NA	——	——	14	8.4	11	9.7	5.9	3.9	ND	4.9	ND	4.5
Hexamethylcyclotrisiloxane	NA	NA	——	——	12	3.5	3.4	ND	ND	15	ND	ND	ND	ND
2-Ethyl-1-hexanol	NA	NA	——	——	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetic acid	NA	NA	2.46E+04	3.68E+04	ND	4.7	ND	ND	ND	ND	ND	ND	ND	ND
2-Butoxyethanol	NA	NA	2.42E+05	9.60E+04	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND
Isopentane	NA	NA	——	——	ND	ND	ND	ND	4.9	ND	ND	ND	ND	ND
Aldehydes														
Formaldehyde	0.94	0.19	9.21E+02	3.68E+02	6.3	6.2	6.2	6.1	ND	ND	ND	1.5	1.7	NS
Acetaldehyde	5.6	1.1	3.31E+04	4.50E+04	1.7	1.5	1.6	1.5	19	10	8.3	1.1	1.5	NS
Valeraldehyde	NA	NA	——	1.76E+05	0.47	0.62	0.46	ND	ND	ND	ND	ND	0.47	NS

MSD 024534

Table 4

Summary of analytical results for all compounds detected in ambient air [1] samples from the downwind locations and on the landfill
Bridgeton Landfill

Compounds/analytes	*RSL ind.* [2]	*RSL Res.* [3]	*OSHA PEL* [4]	*ACGIH TLV* [5]	*Concentrations in μg/m³* [6] *Pond Center*	*Pond East*	*Pond West*	*Summit*	*Amphi-theater*	*East Fenceline #1*	*East Fenceline #2*	*South Fenceline #1*	*South Fenceline #2*	*Summit valley*
2,5-Dimethylbenzaldehyde	NA	NA	——	——	0.94	0.91	0.86	0.9	ND	ND	ND	ND	0.94	NS
Reduced sulfur compounds														
Dimethyl sulfide	NA	NA	——	1.93E+03	NS	NS	NS	NS	NS	19	NS	NS	33	NS
PAHs														
Naphthalene	0.36	0.072	5.24E+04	5.24E+04	NS	NS	NS	0.089	NS	0.029	NS	NS	NS	NS
Acenaphthene	NA	NA	——	——	NS	NS	NS	0.0076	NS	0.004	NS	NS	NS	NS
Fluorene	NA	NA	——	——	NS	NS	NS	0.0089	NS	0.0038	NS	NS	NS	NS
Phenanthrene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.023	NS	0.011	NS	NS	NS	NS
Fluoranthene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.004	NS	0.0021	NS	NS	NS	NS
Pyrene	NA	NA	2.00E+02	2.00E+02	NS	NS	NS	0.002	NS	ND	NS	NS	NS	NS
TCDD TEQ [9]	3.20E-07	6.40E-08	2.0E-04 (Leung HW[10])		--	--	--	1.49E-08	--	7.88E-09	--	--	--	--

Footnotes

1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML
2) RSL Ind. U.S. Regional Risk-based Screening Level for industrial/commercial reference
3) RSL Res. U.S. Regional Risk-based Screening Level for residential reference
4) U.S. Occupational Safety and Health Administration Permissible Exposure Limit
5) American Conference of Governmenta Industrial Hygienists Threshold Limit Value
6) μg/m³ - micrograms per cubic meter
7) ND - not detected
8) American Industrial Hygiene Association Workplace Environmental Exposure Level

Table 4

Summary of analytical results for all compounds detected in ambient air [1] samples from the downwind locations and on the landfill

Bridgeton Landfill

Compounds/analytes	*RSL ind.* [2]	*RSL Res.* [3]	*OSHA PEL* [4]	*ACGIH TLV*[5]	*Pond Center*	*Pond East*	*Pond West*	*Summit*	*Amphi-theater*	*East Fenceline #1*	*East Fenceline #2*	*South Fenceline #1*	*South Fenceline #2*	*Summit valley*
					Concentrations in µg/m³ [6]									

9) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5

10) Lueng HW et al, Am Ind Hyg Assoc J, 1988

Table 5

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); on landfill and downwind

Bridgeton Landfill

Analyte	*TEF* [3]	*Concentrations in ambient air* [1] *on Landfill, in μg/m³* [2]			
		Summit		*East Fenceline #1*	
		Measured	*TEQ* [4]	*Measured*	*TEQ*
2378-TCDD	1	3.58E-09	3.58E-09	ND	NA
12378-PeCDD	1	5.2E-09	5.2E-09	3.62E-09	3.62E-09
123478-HxCDD	0.1	ND	NA	2.66E-09	2.66E-10
123678-HxCDD	0.1	3.98E-09	3.98E-10	6.07E-09	6.07E-10
123789-HxCDD	0.1	6.35E-09	6.35E-10	8.4E-09	8.4E-10
1234678-HpCDD	0.01	3.87E-08	3.87E-10	3.84E-08	3.84E-10
OCDD	0.0003	1.96E-07	5.88E-11	1.57E-07	4.71E-11
2378-TCDF	0.1	1.80E-08	1.8E-09	6.64E-09	6.64E-10
12378-PeCDF	0.03	4.19E-09	1.257E-10	ND	NA
23478-PeCDF	0.3	4.14E-09	1.242E-09	ND	NA
123478-HxCDF	0.1	6.60E-09	6.6E-10	8.64E-09	8.64E-10
123678-HxCDF	0.1	4.89E-09	4.89E-10	2.88E-09	2.88E-10
123789-HxCDF	0.1	ND	NA	ND	NA
234678-HxCDF	0.1	ND	NA	ND	NA
1234678-HpCDF	0.01	2.70E-08	2.7E-10	2.71E-08	2.71E-10
1234789-HpCDF	0.01	ND	NA	ND	NA
OCDF	0.0003	1.09E-07	3.27E-11	8.70E-08	2.61E-11
Total TEQ			**1.49E-08**		**7.88E-09**

US EPA, Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010

Footnotes

1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML
2) μg/m³ - micrograms per cubic meter
3) TEF - Toxicity Equivalence Factor
4) TEQ - Toxicity Equivalent Concentration

Table 6

Summary of analytical results for all compounds detected in at least one upwind/background sample
Bridgeton Landfill

Compounds/analytes	*RSL Ind.* [2]	*RSL Res.* [3]	*OSHA PEL* [4]	*ACGIH TLV* [5]	Concentrations in ug/m^3 [1] Grassy Knoll Center (1)	Grassy Knoll Center (2)	Grassy Knoll West (1)	Grassy Knoll West (2)	Grassy Knoll North (1)	Grassy Knoll North (2)
Volatile organic compounds										
Dichlorofluoromethane	440	100	4.21E+06	4.21E+06	2.1	2.1	2.2	2.2	2.2	2.2
Acetonitrile	260	63	6.72E+04	3.36E+04	ND[6]	0.78	ND	ND	ND	0.88
Acetone	140,000	32,000	2.86E+06	1.19E+06	12	ND	13	ND	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.1	1.1	1.2	1.1	1.1	1.1
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	2.6	ND	3	ND	2.7	ND
Toluene	22,000	5,200	7.54E+-5	7.54E+04	1	ND	1.4	ND	1.1	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	1.4	ND	ND	1.8	ND	ND
Tentatively Identified Compounds										
Unidentified (9.41 RT)	NA	NA	——	——	3.3	ND	ND	ND	4.6	ND
Ethyl propionate	NA	NA	——	——	5	ND	4.7	ND	5.2	ND
Ethyl butyrate	NA	NA	——	——	7.6	5.4	6.5	ND	7.9	ND
Hexamethylcyclotrisiloxane	NA	NA	——	——	3.3	ND	ND	ND	12	ND
Acetic acid	NA	NA	2.46E+-4	3.68E+04	ND	ND	3.7	ND	ND	ND
Aldehydes										
Benzaldehyde	NA	NA	8.69E+03		ND	ND	ND	ND	3.4	ND
Formaldehyde	0.94	0.19	9.21E+02	3.68E+02	ND	2.9	ND	3.1	ND	3.2
Acetaldehyde	5.6	1.1	3.31E+04	4.50E+04	17	1.3	19	1.2	18	1.2
2,5-Dimethylbenzaldehyde	NA	NA	——	1.76E+05	ND	0.41	ND	0.51	ND	0.81
TCDD TEQ	3.20E-07	6.40E-08	2.0E-04 (Leung HW[7])		1.94E-08	--	--	--	--	--

Footnotes

1) µg/m^3 - micrograms per cubic meter
2) RSL Ind. U.S. Regional Risk-based Screening Level for industrial/commercial reference
3) RSL Res. U.S. Regional Risk-based Screening Level for residential reference
4) U.S. Occupational Safety and Health Administration Permissible Exposure Limit
5) American Conference of Governmenta Industrial Hygienists Threshold Limit Value
6) ND - not detected
7) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5
8) Lueng HW et al, Am Ind Hyg Assoc J, 1988

Table 7

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); in upwind samples Bridgeton Landfill

Analyte	*TEF*	*Concentrations in ambient air[1] on Landfill, in μg/m³ [2]* Grassy Knoll Center	
		Measured	*TEQ*
2378-TCDD	1	ND	NA
12378-PeCDD	1	7.51E-09	7.51E-09
123478-HxCDD	0.1	4.85E-09	4.85E-10
123678-HxCDD	0.1	4.33E-09	4.33E-10
123789-HxCDD	0.1	1.08E-08	1.08E-09
1234678-HpCDD	0.01	4.11E-08	4.11E-10
OCDD	0.0003	1.39E-07	4.17E-11
2378-TCDF	0.1	2.65E-08	2.65E-09
12378-PeCDF	0.03	8.53E-09	2.559E-10
23478-PeCDF	0.3	9.90E-09	2.97E-09
123478-HxCDF	0.1	1.64E-08	1.64E-09
123678-HxCDF	0.1	9.18E-09	9.18E-10
123789-HxCDF	0.1	ND	NA
234678-HxCDF	0.1	6.52E-09	6.52E-10
1234678-HpCDF	0.01	3.02E-08	3.02E-10
1234789-HpCDF	0.01	ND	NA
OCDF	0.0003	1.16E-07	3.48E-11
Total TEQ			**1.94E-08**

Footnotes

1) Ambient air samples are collected in open air, as opposed to from sources such as under the FML

2) μg/m³ - micrograms per cubic meter

3) TEF - Toxicity Equivalence Factor

Table 7

Individual polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/PCDF) isomers and conversion to 2, 3, 7, 8-TCDD toxicity equivalents (TEQs); in upwind samples
Bridgeton Landfill

4) TEQ - Toxicity Equivalent Concentration

Table 8

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

Bridgeton Landfill

Compounds/analytes	*Odor Threshold*	*Contentration, in µg/m³ [8]* *Laboratory MRL [7] (range)*	*Concentration detected in landfill and downwind ambient air samples (range) [6]*	*Characterization of Odor*
Volatile Organic Compounds				
Propene	39,584[3]	0.69 - 1.4	1.1 - 2.2	Grassy, aromatic
Chloromethane	NP[4]	0.69 - 1.4	ND[5]	Ether
1,3-Butadiene	220[1]	0.69 - 1.4	ND	Aromatic, rubber
Chloroethane	NP	0.69 - 1.4	ND	
Ethanol	342[2]	0.69 - 1.4	8.5 - 16	Sweet alcohol
Acetone	47,500[2]	0.69 - 1.4	8.9 - 21	Sweet minty, chemical
2-Propanol	105,697[3]	0.69 - 1.4	ND	Rubbing alcohol
2-Butanone (MEK)	750[1]	0.69 - 1.4	11	Sweet
Ethyl acetate	1.0[1]	1.4 - 2.8	1.6 - 17	Fruity, pleasant
n-Hexane	NP[3]	0.69 - 1.4	ND	Gasoline
Tetrahydrofuran	7,375[2]	0.69 - 1.4	1.2 - 4.7	Ether-like
Benzene	4,500[2]	0.69 - 1.4	1.1 - 16	Sweet solvent
Cyclohexane	1,435[2]	1.4 - 2.8	ND	Sweet aromatic
1,4-Dioxane	10.8[2]	0.69 - 1.4	ND	Ether-like
n-Heptane	200,000[2]	0.69 - 1.4	ND	Gasoline
4-methyl-2-pentanone	410[2]	0.69 - 1.4	ND	Sweet, sharp
Toluene	1,000[1]	0.69 - 1.4	1.1 - 3.7	Rubbery mothballs
2-Hexanone	NP	0.69 - 1.4	ND	Sweet, paint
n-Butyl acetate	2,993[3]	0.69 - 1.4	ND	Sweet banana
n-Octane	725,000[2]	0.69 - 1.4	0.98	Gasoline
Chlorobenzene	980[2]	0.69 - 1.4	ND	Almond-like, shoe polish
Ethylbenzene	400[1]	0.69 - 1.4	0.72 - 091	Oily solvent
m,p-Xylenes	1,000[1]	0.69 - 1.4	1.5 - 3.2	
O-Xylene	1,000[1]	0.69 - 1.4	1.1	
Styrene	430[2]	0.69 - 1.4	ND	Solvent, rubbery
n-Nonane	3,412,500[2]	0.69 - 1.4	0.87	
Cumene	39.2[2]	0.69 - 1.4	ND	Sharp
Alpha-Pinene	NP	0.69 - 1.4	1.1	
n-Propylbenzene	NP	0.69 - 1.4	ND	
4-Ethyltoluene	NP	0.69 - 1.4	ND	
1,3,5-Trimethylbenzene	10,815[3]	0.69 - 1.4	ND	
1,2,4-Trimethylbenzene	11,798[3]	0.69 - 1.4	ND	
1,4-Dichlorobenzene	722[3]	0.69 - 1.4	ND	Mothballs
d-Limonene	NP	0.69 - 1.4	0.99	Citrus

Table 8

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

Bridgeton Landfill

Compounds/analytes	Odor Threshold	Laboratory MRL [7] (range)	Concentration detected in landfill and downwind ambient air samples (range) [6]	Characterization of Odor
		Contentration, in µg/m [3 (8)]		
Naphthalene	50[1]	0.69 - 1.4	ND	Mothballs
Tentatively Identified Compounds				
Furan	NP	NA	3.4 - 13	
Dimethyl sulfide	2.5[2]	NA	2.8 - 12	Decayed cabbage
Methyl acetate	412[2]	NA	10	Sweet ester
2-Methylfuran	90,450[2]	NA	3.7 - 14	
Methyl propionate	NP	NA	5.5	
1-Butanol	2,638[3]	NA	ND	Sweet alcohol
2-Pentanone	27,125[3]	NA	ND	
Methyl butyrate	52.8[2]	NA	12	Body odor
Dimethyl disulfide	0.1[2]	5.2 - 7.5	ND	
2-Methyl cyclopentanone	NP	NA	ND	
Methyl hexanoate	NP	NA	ND	
2-Ethyl cyclopentanone	NP	NA	ND	
n-Decane	NP	NA	ND	
p-Isopropyltoluene	NP	NA	ND	
n-Undecane	NP	NA	ND	
Dimethyl ether	NP	NA	ND	
Isobutene	NP	NA	2.9	
n-Butane	NP	NA	ND	
C4-H8 Alkene (5.51 RT)	NP	NA	ND	
C4-H8 Alkene (5.80 RT)	NP	NA	ND	
Isopentene	NP	NA	ND	
Cyclopentene	NP	NA	ND	
C6-H10 Alkene (13.0 RT)	NP	NA	4.6	
C10-H12 Alkene (14.58 RT)	NP	NA	ND	
C10-H12 Alkene (14.63 RT)	NP	NA	ND	
3-Methyl-3-heptene	NP	NA	ND	
C8-H14 Alkene (16.96 RT)	NP	NA	ND	
C8-H14 Alkene (16.89 RT)	NP	NA	ND	
Aldehydes				
Acetaldehyde	0.2[2]	0.32 - 0.70	1.1 - 19	
Propionaldehyde	10[1]	0.32 - 0.70	ND	

Table 8

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

Bridgeton Landfill

Compounds/analytes	Odor Threshold	Laboratory MRL [7] (range)	Concentration detected in landfill and downwind ambient air samples (range) [6]	Characterization of Odor
	Contentration, in µg/m^3 [8]			
Butyraldehyde	13.6[2]	0.32 - 0.70	ND	
Benzaldehyde	8[2]	0.32 - 0.70	ND	
Isovaleraldehyde	NP	0.32 - 0.70	ND	
Valeraldehyde	NP	0.32 - 0.70	0.47 - 0.62	Decayed, rancid
o-Tolualdehyde	NP	0.65 - 1.4	ND	
2,5-Dimethylbenzaldehyde	NP	0.32 - 0.70	0.86 - 0.94	
Reduced Sulfur Compounds				
Hydrogen sulfide	0.7[2]	7	ND	Rotten eggs
Carbonyl sulfide	24.3[2]	12	ND	
Methyl mercaptan	0.04[2]	9.8	ND	Sulfide-like
Ethyl mercaptan	0.0032[2]	13	ND	Garlic
Dimethyl sulfide	2.5[2]	13	19 - 33	Decayed cabbage
Carbon disulfide	24.3[2]	7.8	ND	Disagreeable
Isopropyl mercaptan	0.2[2]	16	ND	
t-Butyl mercaptan	1.6[2]	18	ND	
Ethyl methyl sulfide	48.7[2]	16	ND	
Thiophene	2.6[2]	17	ND	Aromatic
Isobutyl mercaptan	2.0[2]	18	ND	
n-Butyl mercaptan	1.6[2]	18	ND	
Dimethyl disulfide	0.1[2]	9.6	ND	
3-Methylthiophene	NP	20	ND	
Tetrahydrothiophene	NP	18	ND	
2,5-Dimethylthiophene	NP	23	ND	
2-Ethylthiophene	NP	23	ND	
Carboxylic Acid Compounds				
Acetic Acid	2,500[2]	20	ND	Sour, vinegar
Propionic Acid	200[3]	2.4	ND	Sour
2-Methylpropionic Acid	NP	2.5	ND	
Butanoic Acid	1.0[2]	2.4	ND	Sour, perspiration
3-Methylbutanoic Acid	52.8[2]	2.4	ND	Body odor
Pentanoic (Valeric) Acid	2.6[2]	2.5	ND	
3-Methylpentanoic Acid	NP	2.5	ND	
4-Methylpentanoic Acid	NP	2.5	ND	
Hexanoic (Caproic) Acid	NP	2.5	ND	

Table 8

Summary of compounds detected under the FML with associated odor thresholds, and concentrations detected in downwind and landfill ambient air samples

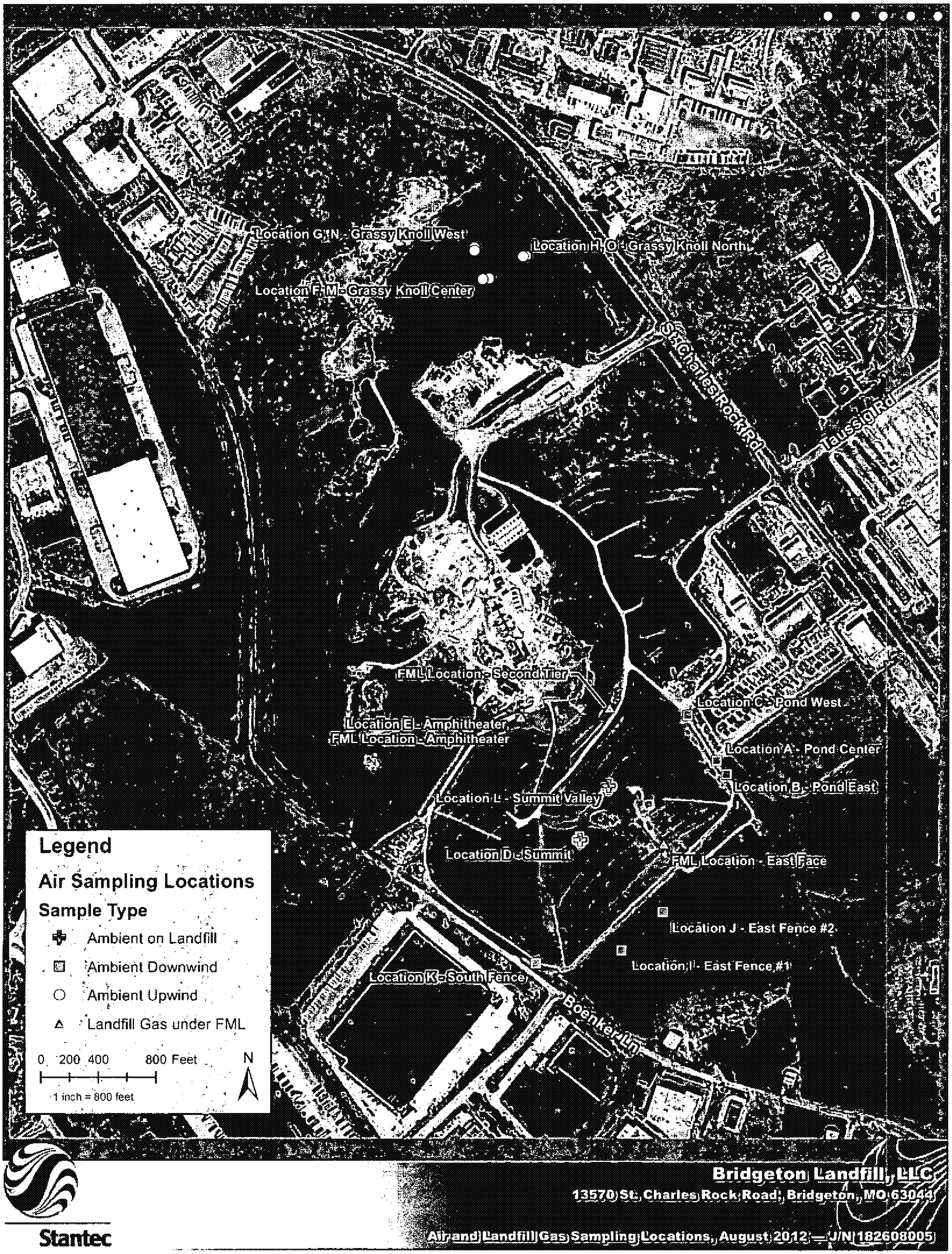
Bridgeton Landfill

Compounds/analytes	*Odor Threshold*	*Laboratory MRL [7] (range)*	*Concentration detected in landfill and downwind ambient air samples (range) [6]*	*Characterization of Odor*
		Contentration, in μg/m³ [8]		
Heptanoic Acid	NP	2.4	ND	
2-Ethylhexanoic Acid	NP	2.5	ND	
Octanoic (Caprylic) Acid	NP	2.4	ND	
PAHs				
Naphthalene	50[1]	0.011 - 0.015	0.029 - 0.089	Mothballs
Acenaphthene	505[2]	0.011 - 0.015	0.004 - 0.0076	
Fluorene	6,000[2]	0.011 - 0.015	0.0038- 0.0089	
Phenanthrene	NP	0.011 - 0.015	0.011 - 0.023	
Anthracene	NP	0.011 - 0.015	ND	
Fluoranthene	NP	0.011 - 0.015	0.0021 - 0.004	
Pyrene	NP	0.011 - 0.015	0.002	
TCDD TEQ[10]	NP	NA[9]	7.88E-09 - 1.49E-08	

Footnotes

1) US EPA, Reference Guide to Odor Thresholds for Hazardous Air Pollutants Listed in the Clean Air Act Amendments of 1990, EPA/600/R-92/047, March 1992
2) Ruth, J.H., Odor Thresholds and Irritation Levels of Several Chemical Substances: A Review, Am. Ind. Hyg. Assoc. J. 47:A-142 through A-151, March 1986
3) American Industrial Hygiene Association, Odor Thresholds for Chemicals with Established Occupational Health Standards, 1997 edition
4) NP - not published
5) ND - not detected
6) Does not include samples where the comound was undetected (ND)
7) MRL - Minimum Reporting Limit
8) μg/m³ - micrograms per cubic meter
9) NA - not available
10) U.S. EPA recommended 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEQ) using the Toxicity Equivalence Factors (TEFs) (U.S. EPA, December 2010), see also Table 5
11) Odor descriptions for the individual compounds as given in the source reference

Figures


Location G/N - Grassy Knoll West
Location H/O - Grassy Knoll North
Location F/M - Grassy Knoll Center
St Charles Rock Rd
Taussig Rd
FML Location - Second Tier
Location C - Pond West
Location E - Amphitheater
FML Location - Amphitheater
Location A - Pond Center
Location B - Pond East
Location L - Summit Valley
Location D - Summit
FML Location - East Face
Location J - East Fence #2
Location I - East Fence #1
Location K - South Fence
Boenker Ln
Legend
Air Sampling Locations
Sample Type
Ambient on Landfill
Ambient Downwind
Ambient Upwind
Landfill Gas under FML
0 200 400 800 Feet
1 inch = 800 feet
N
Stantec
Bridgeton Landfill, LLC
13570 St. Charles Rock Road, Bridgeton, MO 63044
Air and Landfill Gas Sampling Locations, August 2012 — J/N 182608005

MSD 024546

Photographs

Bridgeton Landfill Air and Landfill Gas Sampling
August 2012

PHOTOGRAPHS

Figure 1
Stantec and MDNR personnel collecting VOC samples from one of the sampling ports beneath the FML.

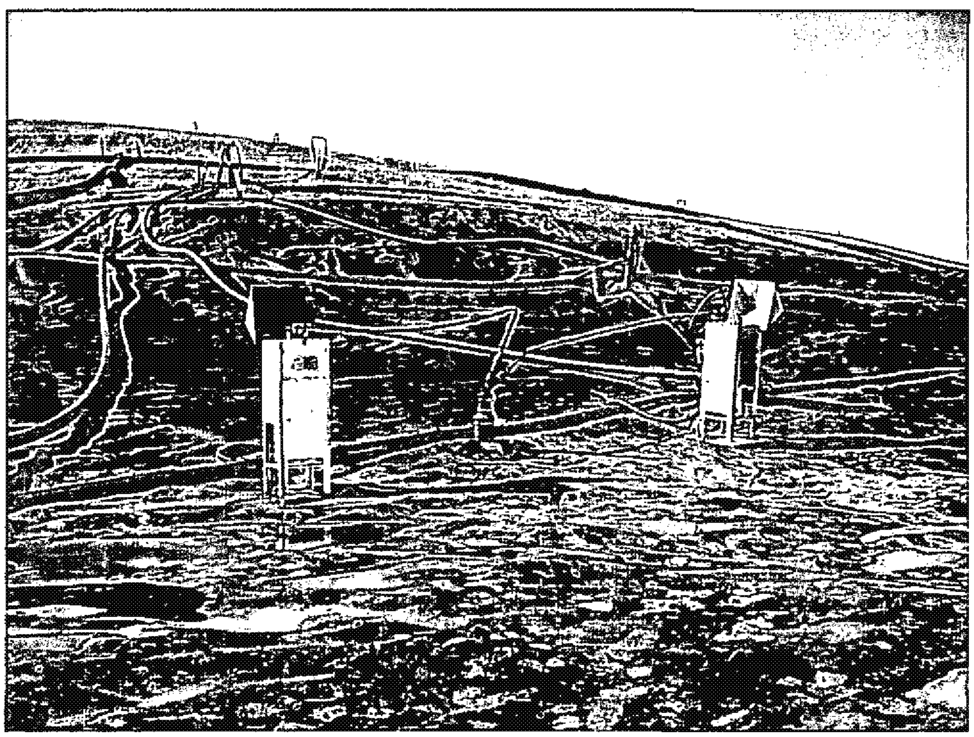


Figure 2
High volume sampling of source gas from under the FML on the amphitheater, second tier, and east face

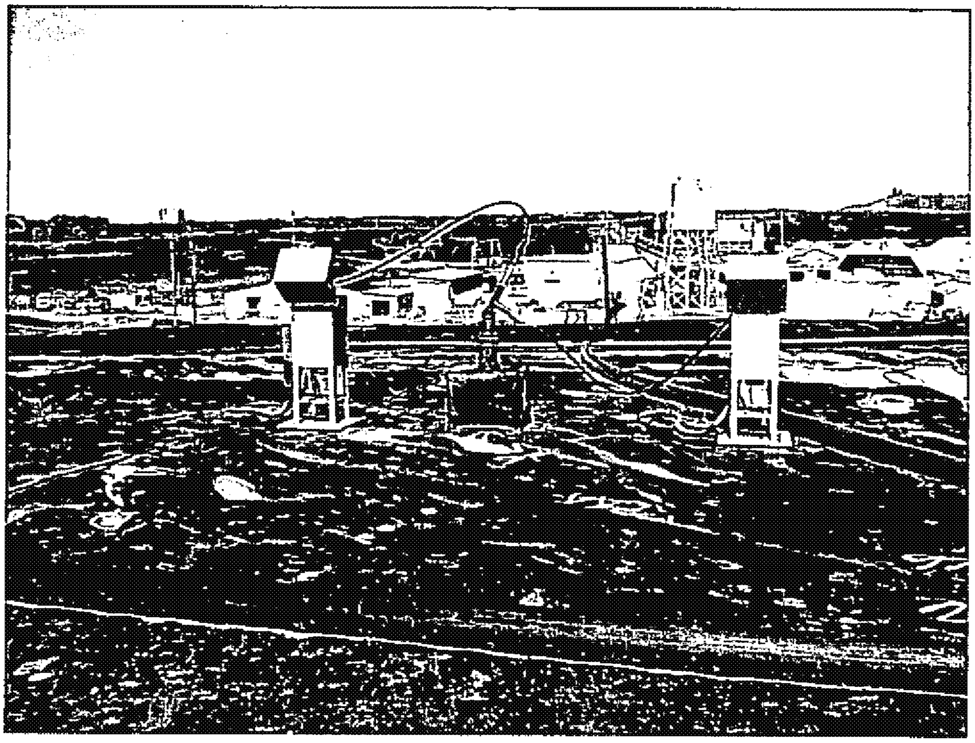


Figure 3
High volume sampling of source gas from under the FML on the second tier

Figure 4
High volume sampling of source gas from under the FML on the east face

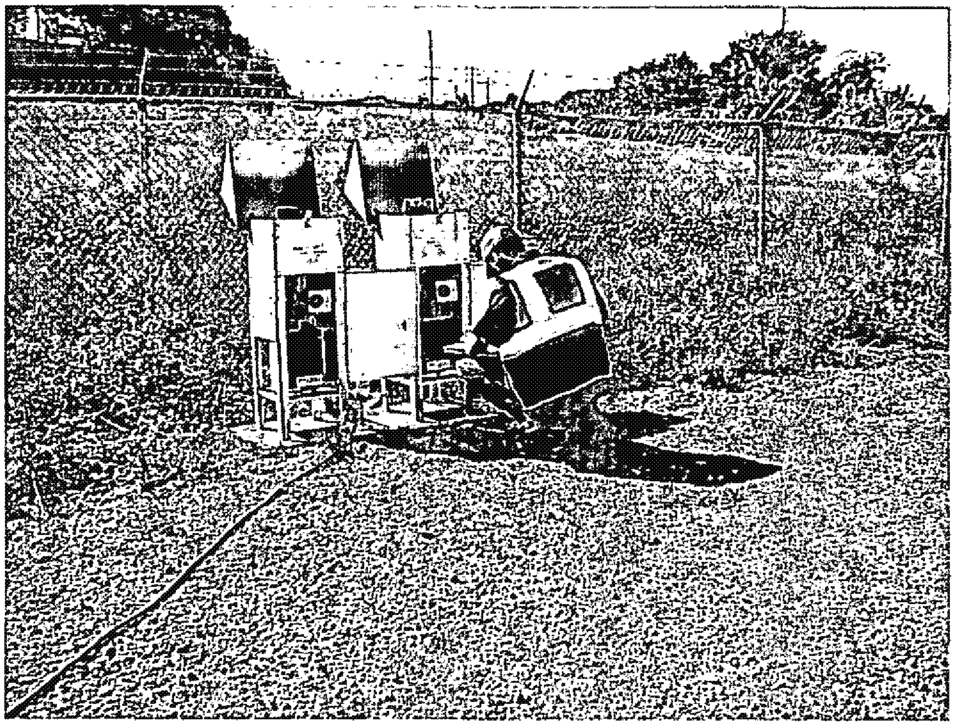


Figure 5
Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis

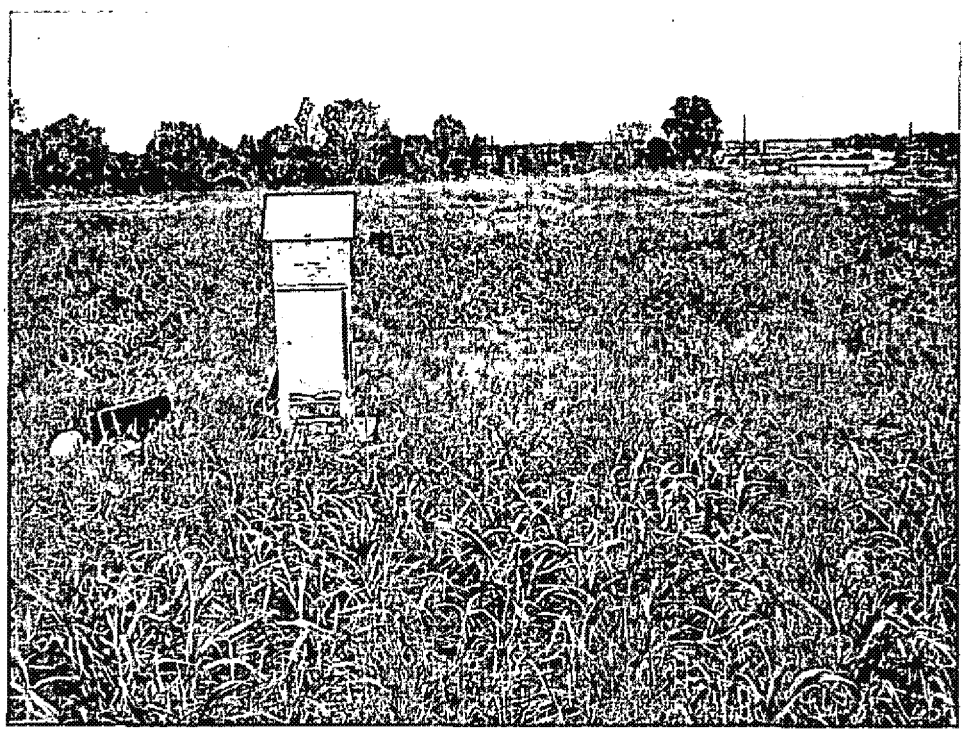


Figure 6
Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis

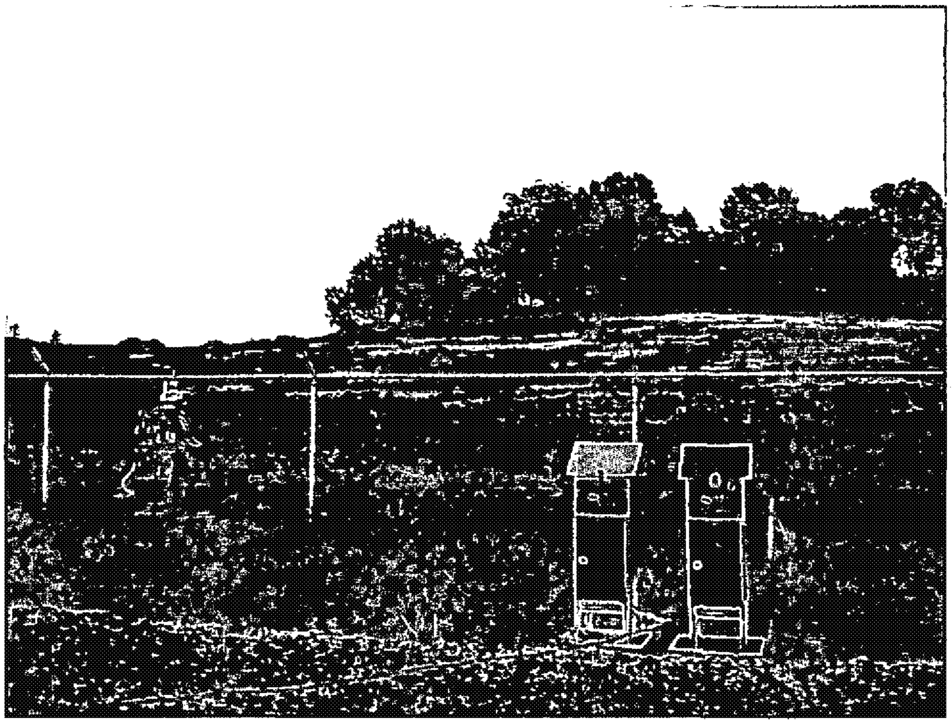


Figure 7

Apparatus used to collect ambient air or source gas for PAH and Dioxin/Dibenzofuran analysis

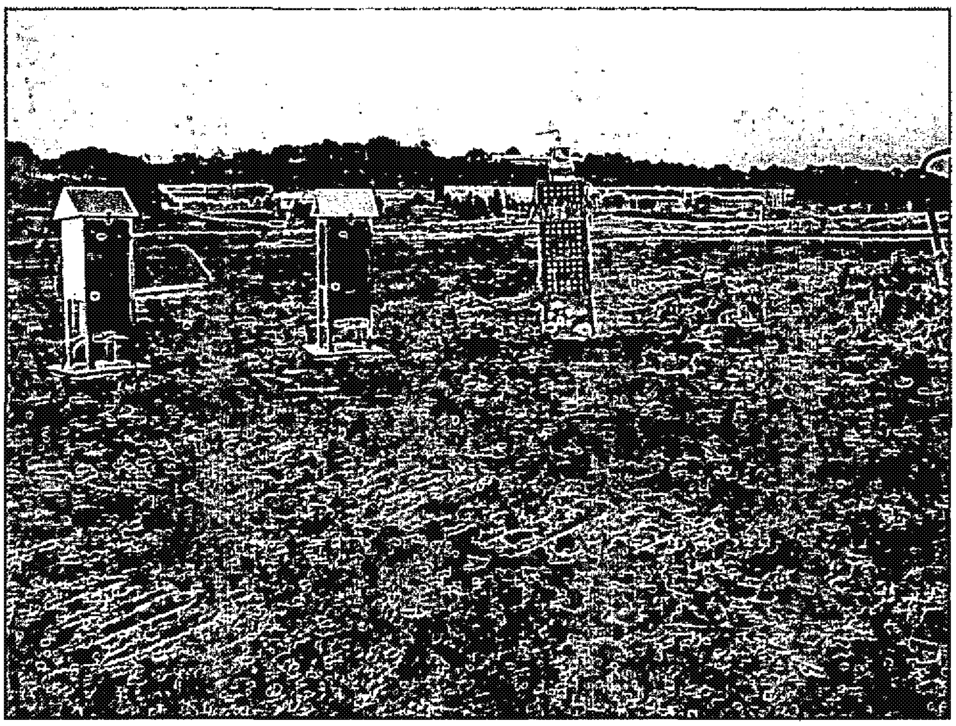


Figure 8

Ambient air sample collection structures and pump assemblies

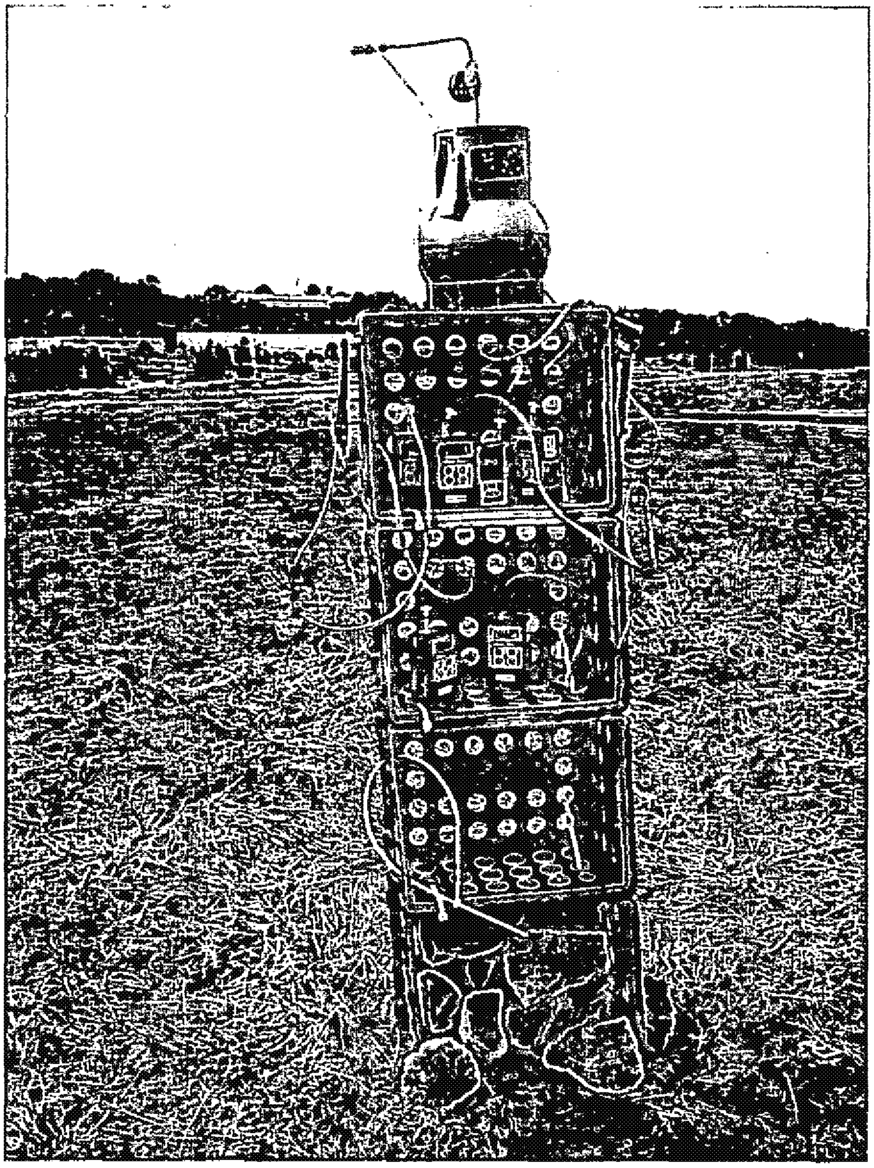


Figure 9
Ambient air sample collection structures and pump assemblies

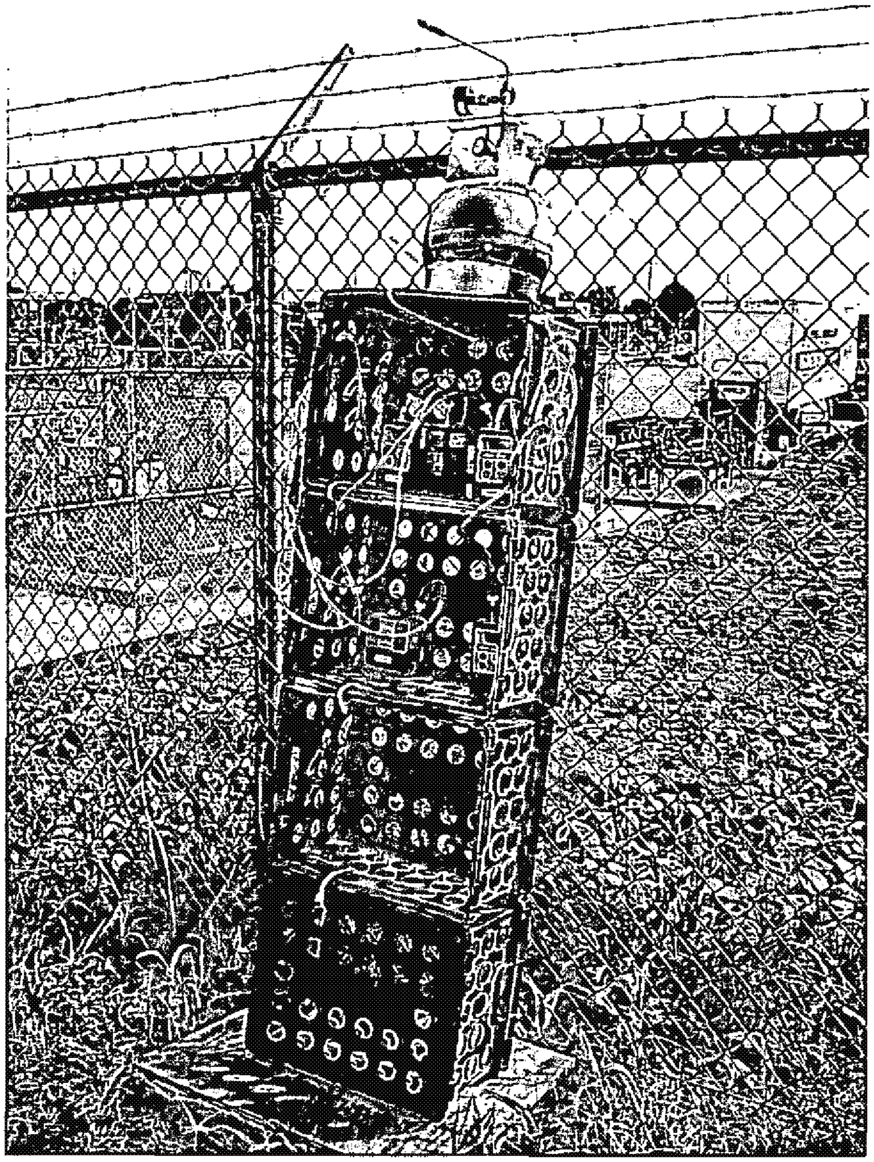
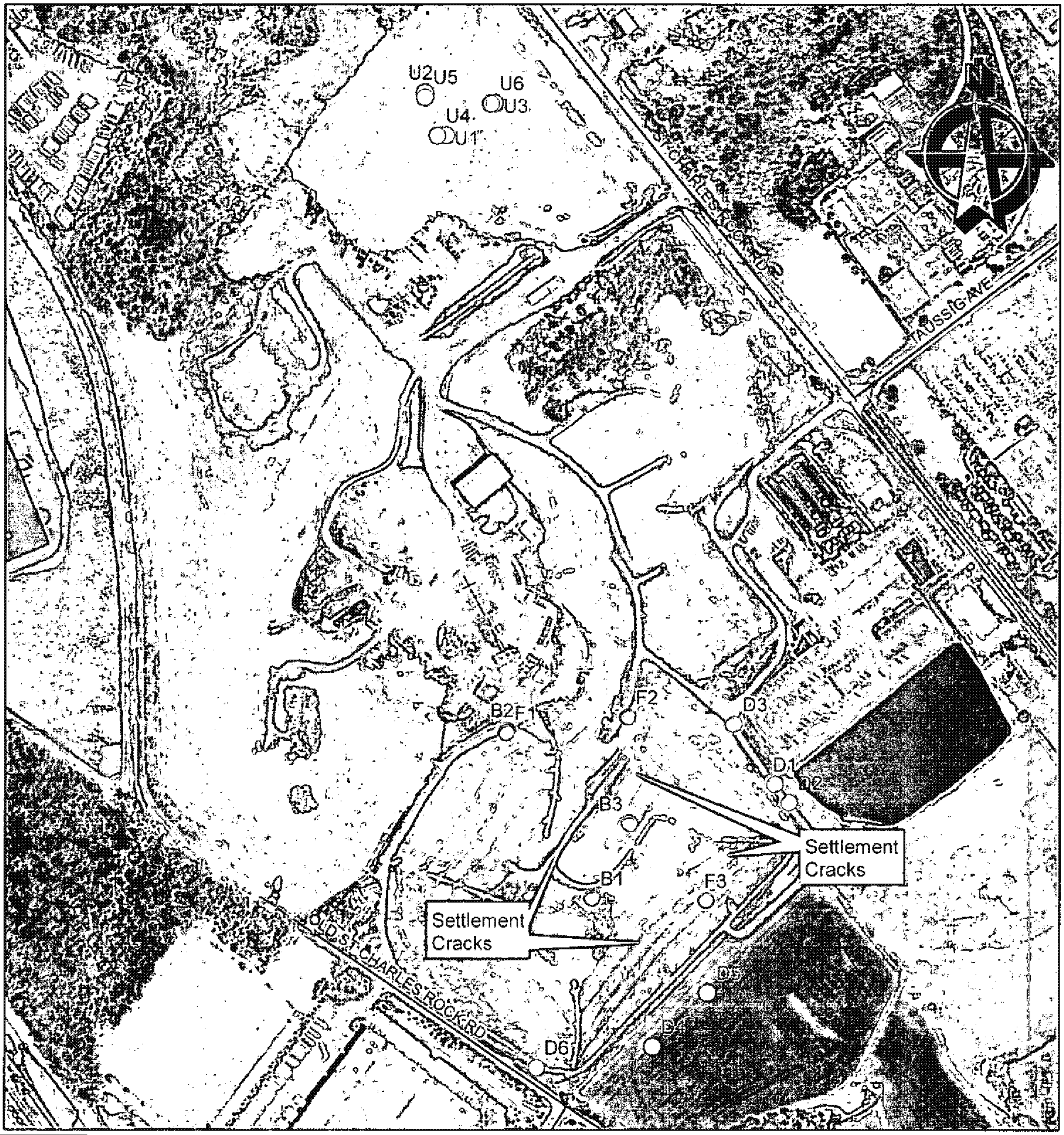


Figure 10
Ambient air sample collection structures and pump assemblies

Bridgeton Sanitary Landfill
August 2012 Ambient Air and Combustion Byproduct Sampling



Last Updated 11/30/2012 nmorrd

Missouri Department of Natural Resources
Division of Environmental Quality
Solid Waste Management Program

0 375 750 1,500 Feet

Legend - Sample Type

- Breathing Zone
- FML Source
- Downwind
- Upwind

Although data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

Missouri Department of Natural Resources
Environmental Services Program

Order ID 120817004 **Program, Contact:** SWMF Cecilia Campbell

Report Date: 09/13/2012 **LDPR/JobCode:** FEASW

RECEIVED
SEP 1 7 2012

Sample: AB82835
Customer #: 1203775

F1

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

SWMP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
TO-15 (In House)	1,1,1-Trichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2,2-Tetrachloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2-Trichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1-Dichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1-Dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2,4-Trichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2,4-Trimethylbenzene	4880		ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichloropropane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichlorotetrafluoroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3,5-Trimethylbenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3-Butadiene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,4-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,4-Dioxane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Butanone (MEK)	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Hexanone	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Propanol	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	4-Ethyltoluene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	4-Methyl-2-pentanone(MIBK)	5020		ppb	17,635	TO-15
TO-15 (In House)	Acetone	283000		ppb	17,635	TO-15
TO-15 (In House)	Benzene	40900		ppb	17,635	TO-15
TO-15 (In House)	Benzyl Chloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromodichloromethane	<5	ND	ppb	17,635	TO-15

Sample: AB82835
Customer #: 1203775

F1

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
TO-15 (In House)	Bromoform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromomethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Disulfide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Tetrachloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	cis-1,2-dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	cis-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Cyclohexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dibromochloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dichlorodifluoromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethanol	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethylbenzene	6610		ppb	17,635	TO-15
TO-15 (In House)	Ethylene Dibromide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Heptane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexachloro-1,3-butadiene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	m&p-Xylenes	9100		ppb	17,635	TO-15
TO-15 (In House)	Methylene chloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Methyl-t-butyl ether	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	o-Xylene	3100		ppb	17,635	TO-15
TO-15 (In House)	Propylene	13100		ppb	17,635	TO-15
TO-15 (In House)	Styrene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrachloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrahydrofuran	61300		ppb	17,635	TO-15
TO-15 (In House)	Toluene	11900		ppb	17,635	TO-15
TO-15 (In House)	trans-1,2-Dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	trans-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroflouromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Chloride	<5	ND	ppb	17,635	TO-15

120817004

MSD 024557

ample: AB82836

Customer #: 1203776

F2

Facility ID:
County:

Site: Bridgeton Landfill
Sample Reference ID:

Collector: JIM BRUNNERT

Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Entry Point:

Sample Comment: Grab sample taken under the liner.

est	Parameter	Result	Qualifier	Units	QC Batch ID	Method
O-15 (In House)	1,1,1-Trichloroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,1,2,2-Tetrachloroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,1,2-Trichloroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,1-Dichloroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,1-Dichloroethene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2,4-Trichlorobenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2,4-Trimethylbenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2-Dichloroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2-Dichloropropane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,2-Dichlorotetrafluoroethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,3,5-Trimethylbenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,3-Butadiene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,3-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,4-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	1,4-Dioxane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	2-Butanone (MEK)	<5	ND	ppb	17,635	TO-15
O-15 (In House)	2-Hexanone	<5	ND	ppb	17,635	TO-15
O-15 (In House)	2-Propanol	<5	ND	ppb	17,635	TO-15
O-15 (In House)	4-Ethyltoluene	<5	ND	ppb	17,635	TO-15
O-15 (In House)	4-Methyl-2-pentanone(MIBK)	<5	ND	ppb	17,635	TO-15
O-15 (In House)	Acetone	38500		ppb	17,635	TO-15
O-15 (In House)	Benzene	262000		ppb	17,635	TO-15
O-15 (In House)	Benzyl Chloride	<5	ND	ppb	17,635	TO-15
O-15 (In House)	Bromodichloromethane	<5	ND	ppb	17,635	TO-15
O-15 (In House)	Bromoform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromomethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Disulfide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Tetrachloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	cis-1,2-dichloroethene	<5	ND	ppb	17,635	TO-15

Sample: AB82836

Customer #: 1203776

F2

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
TO-15 (In House)	cis-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Cyclohexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dibromochloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dichlorodifluoromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethanol	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethylbenzene	9890		ppb	17,635	TO-15
TO-15 (In House)	Ethylene Dibromide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Heptane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexachloro-1,3-butadiene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	m&p-Xylenes	7270		ppb	17,635	TO-15
TO-15 (In House)	Methylene chloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Methyl-t-butyl ether	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	o-Xylene	4170		ppb	17,635	TO-15
TO-15 (In House)	Propylene	85900		ppb	17,635	TO-15
TO-15 (In House)	Styrene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrachloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrahydrofuran	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Toluene	34000		ppb	17,635	TO-15
TO-15 (In House)	trans-1,2-Dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	trans-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroflouromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Chloride	<5	ND	ppb	17,635	TO-15

Sample: AB82837

Customer #: 1203777

F3

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method

Sample: AB82837

Customer #: 1203777

F3

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
TO-15 (In House)	1,1,1-Trichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2,2-Tetrachloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2-Trichloro-1,2,2-Trifluoroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1,2-Trichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1-Dichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,1-Dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2,4-Trichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2,4-Trimethylbenzene	3960		ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichloropropane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,2-Dichlorotetrafluoroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3,5-Trimethylbenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3-Butadiene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,3-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,4-Dichlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	1,4-Dioxane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Butanone (MEK)	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Hexanone	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	2-Propanol	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	4-Ethyltoluene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	4-Methyl-2-pentanone(MIBK)	3950		ppb	17,635	TO-15
TO-15 (In House)	Acetone	52500		ppb	17,635	TO-15
TO-15 (In House)	Benzene	141000		ppb	17,635	TO-15
TO-15 (In House)	Benzyl Chloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromodichloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromoform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Bromomethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Disulfide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Carbon Tetrachloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chlorobenzene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloroform	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Chloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	cis-1,2-dichloroethene	<5	ND	ppb	17,635	TO-15

120817004

MSD 024560

Sample: AB82837
Customer #: 1203777

F3

Facility ID:
County:
Collector: JIM BRUNNERT
Entry Point:
Sample Comment: Grab sample taken under the liner.

Site: Bridgeton Landfill
Sample Reference ID:
Affiliation: ESP

Collect Date: 8/17/2012 12:00:00AM

Test	Parameter	Result	Qualifier	Units	QC Batch ID	Method
TO-15 (In House)	cis-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Cyclohexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dibromochloromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Dichlorodifluoromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethanol	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Ethylbenzene	6840		ppb	17,635	TO-15
TO-15 (In House)	Ethylene Dibromide	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Heptane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexachloro-1,3-butadiene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Hexane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	m&p-Xylenes	7940		ppb	17,635	TO-15
TO-15 (In House)	Methylene chloride	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Methyl-t-butyl ether	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	o-Xylene	5720		ppb	17,635	TO-15
TO-15 (In House)	Propylene	37800		ppb	17,635	TO-15
TO-15 (In House)	Styrene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrachloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Tetrahydrofuran	21300		ppb	17,635	TO-15
TO-15 (In House)	Toluene	19400		ppb	17,635	TO-15
TO-15 (In House)	trans-1,2-Dichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	trans-1,3-Dichloropropene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroethene	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Trichloroflouromethane	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Acetate	<5	ND	ppb	17,635	TO-15
TO-15 (In House)	Vinyl Chloride	<5	ND	ppb	17,635	TO-15

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S Environmental Protection Agency.

Lori Dunmire for Chris Boldt

Chris Boldt, Laboratory Manager
Environmental Services Program
Division of Environmental Quality

Qualifier Descriptions

01 Improper collection method
03 Exceeded holding time
05 Estimated value, detected below PQL
07 Estimated value, analyte outside calibration range
09 Sample was diluted during analysis
11 Estimated value, matrix interference
13 Estimated value, true result is >= reported value
15 No Result - Failed Quality Controls Requirements
17 Results in dry weight
19 Estimated value
21 No result - spectral interference
23 Contract Lab specific qualifier - see sample comments
25 No Result: Excessive Chlorination
ND Not detected at reported value

02 Improper preservation
04 Analyzed by Contract Laboratory
06 Estimated value, QC data outside limits
08 Analyte present in blank at > 1/2 reported value
10 Laboratory error
12 Insufficient quantity
14 Estimated value, non-homogeneous sample
16 Not analyzed - related analyte not detected
18 Sample pH is outside the acceptable range
20 Not analyzed - Instrument failure
22 pH was performed at the Laboratory
24 No result - matrix interference
26 No Result: Excessive Dechlorination

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Table 1

All Analytes Detected in Samples of Gas from Under the FML

Volatile Organic Compounds	Concentrations in µg/m³					
	Amphitheater		Second Tier		East Face	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Propene	27,000	22,546	95,000	168,919	37,000	74,332
Chloromethane	ND		ND		2,700	
1,3-Butadiene	590		ND		ND	
Chloroethane	ND		5600		ND	
Ethanol	99,000		ND		ND	
Acetone	500,000	672,255	ND	91,455	72,000	124,712
2-Propanol	60,000		ND		ND	
2-Butanone (MEK)	340,000		ND		89,000	
Ethyl acetate	4,800		ND		ND	
n-Hexane	2,100		ND		2,900	
Tetrahydrofuran	170,000	180,816	39,000	ND	70,000	62,828
Benzene	120,000	130,663	620,000	837,007	390,000	450,450
Cyclohexane	1,100		ND		ND	
1,4-Dioxane	4,100		ND		ND	
n-Heptane	3,200		8,000		3,300	
4-methyl-2-pentanone	30,000	20,565	ND	ND	16,000	16,181
Toluene	43,000	44,845	100,000	128,129	48,000	73;109
2-Hexanone	11,000		ND		3,100	
n-Butyl acetate	12,000		ND		ND	
n-Octane	9,500		17,000		13,000	
Chlorobenzene	3,000		ND		ND	
Ethylbenzene	27,000	38,700	32,000	42,942	22,000	29,699
m,p-Xylenes	57,000	39,511	37,000	31,566	40,000	34,475
O-Xylene	20,000	13,460	12,000	18,106	16,000	24,836
Styrene	1,200		ND		ND	
n-Nonane	16,000		17,000		9,000	
Cumene	6,000		5,200		4,300	
Alpha-Pinene	12,000		53,000		16,000	
n-Propylbenzene	3,800		ND		2,200	
4-Ethyltoluene	4,900		ND		2,900	
1,3,5-Trimethylbenzene	6,700		ND		3,500	
1,2,4-Trimethylbenzene	19,000	23,989	ND	ND	8,300	19,466
1,4-Dichlorobenzene	10,000		ND		3,200	
d-Limonene	22,000		22,000		21,000	
Naphthalene	510		ND		ND	
Tentatively Identified Compounds	**Amphitheater**		**Second Tier**		**East Face**	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Furan	46,000		120,000		300,000	
Dimethyl sulfide	68,000		83,000		280,000	
Methyl acetate	44,000		ND		ND	
2-Methylfuran	68,000		380,000		240,000	
Methyl propionate	45,000		ND		ND	
1-Butanol	73,000		ND		ND	
2-Pentanone	59,000		ND		ND	
Methyl butyrate	110,000		ND		ND	
Dimethyl disulfide	70,000		ND		42,000	
2-Methyl cyclopentanone	51,000		ND		ND	
Methyl hexanoate	43,000		ND		ND	
2-Ethyl cyclopentanone	41,000		ND		ND	
n-Decane	40,000		ND		ND	
p-Isopropyltoluene	120,000		ND		42,000	
n-Undecane	46,000		ND		ND	

Tentatively Identified Compounds (cont'd)	Amphitheater		Second Tier		East Face	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Dimethyl ether	ND		120,000		ND	
Isobutene	ND		140,000		85,000	
n-Butane	ND		41,000		35,000	
C4-C8 Alkene (5.51 RT)	ND		83,000		33,000	
C4-C8 Alkene (5.80 RT)	ND		90,000		34,000	
Isopentene	ND		42,000		ND	
Cyclopentene	ND		41,000		33,000	
C6-C10 Alkene (13.0 RT)	ND		110,000		74,000	
C10-C12 Alkene (14.58 RT)	ND		92,000		71,000	
C10-C12 Alkene (14.63 RT)	ND		110,000		93,000	
3-Methyl-3-heptene	ND		27,000		29,000	
C8-C14 Alkene (16.96 RT)	ND		22,000		ND	
C8-C14 Alkene (16.89 RT)	ND		ND		31,000	
Aldehydes	**Amphitheater**		**Second Tier**		**East Face**	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Formaldehyde	ND		ND		ND	
Acetaldehyde	1,200		ND		350	
Propionaldehyde	660		ND		140	
Butyraldehyde	3,000		ND		1,500	
Benzaldehyde	2,300		140		990	
Isovaleraldehyde	ND		120		ND	
Valeraldehyde	ND		1,200		ND	
o-Tolualdehyde	ND		340		92	
2,5-Dimethylbenzaldehyde	720		ND		960	
Reduced Sulfur Compounds	**Amphitheater**		**Second Tier**		**East Face**	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Hydrogen sulfide	ND		27		ND	
Carbonyl sulfide	ND		150		150	
Methyl mercaptan	490		4,000		260	
Ethyl mercaptan	460		130		17	
Dimethyl sulfide	240,000		600,000		570,000	
Carbon disulfide	190		180		2,300	
Isopropyl mercaptan	210		170		ND	
t-Butyl mercaptan	380		29		ND	
Ethyl methyl sulfide	12,000		4,000		5,100	
Thiophene	11,000		5,000		19,000	
Isobutyl mercaptan	ND		420		ND	
n-Butyl mercaptan	2,100		710		1,400	
Dimethyl disulfide	4,100		20,000		54,000	
3-Methylthiophene	840		330		900	
Tetrahydrothiophene	ND		210		380	
2,5-Dimethylthiophene	ND		ND		800	
2-Ethylthiophene	ND		ND		840	
Carboxylic Acids	**Amphitheater**		**Second Tier**		**East Face**	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Acetic Acid	11,000		ND		ND	
Propionic Acid	13,000		ND		9,200	
2-Methylpropionic Acid	12,000		ND		13,000	
Butanoic Acid	56,000		ND		41,000	
3-Methylbutanoic Acid	11,000		ND		9,000	
Pentanoic Acid	23,000		ND		3,800	
3-Methylpentanoic Acid	610		ND		ND	
4-Methylpentanoic Acid	1,100		ND		ND	
Hexanoic Acid	53,000		ND		1,200	
Heptanoic Acid	2,900		ND		ND	
2-Ethylhexanoic Acid	4,800		ND		1,800	
Octanoic Acid	690		ND		ND	

PAHs	Amphitheater		Second Tier		East Face	
	Stantec	*MDNR*	*Stantec*	*MDNR*	*Stantec*	*MDNR*
Naphthalene	35		7.9		13	
Acenaphthene	4.5		0.23		0.22	
Fluorene	3.4		0.2		0.18	
Phenanthrene	0.21		0.44		0.19	
Anthracene	0.19		0.022		0.041	
Fluoranthene	ND		0.019		0.026	
Pyrene	ND		0.021		0.016	
TCDD TEQ	1.52E-08		1.03E-08		3.00E-08	

Table 2

All Analytes Detected in Air Samples from Locations on the Landfill and Downwind Fence Line Locations

Volatile Organic Compounds	Concentrations in µg/m³													
	RSL Ind.	RSL Res.	OSHA PEL	ACGIH TLV	Pond Center	Pond East	Pond West	Summit	Amphi-theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit Valley
Propene	13,000	3,100	——	8.61E+05	1.6	1.8	2	ND	ND	1.8	1.1	0.86	2.2	1.8
Dichlorofluoromethane	440	100	4.21E+06	4.21E+04	2.2	2.7	2.3	2.2	2.1	2.2	2.2	0.86	2.2	1.8
Ethanol	140,000	32,000	1.88E+06	1.88E+06	ND	ND	ND	ND	16	ND	12	ND	ND	8.5
Acetonitrile	260	63	6.72E+04	3.36E+04	0.82	ND	ND	ND	0.76	0.88	14	ND	1.9	ND
Acetone	140,000	32,000	2.38E+06	1.19E+06	17	18	13	13	14	11	ND	8.9	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.2	1.4	1.3	1.3	1.1	1.1	1.1	1.1	ND	1.1
Methylene chloride	1,200	96	8.68E+04	1.74E+05	ND	ND	ND	ND	ND	0.94	0.79	ND	2.1	0.88
2-Butanone (MEK)	22,000	5,200	5.90E+05	5.90E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	11
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	17	5	8.7	8	3.1	ND	ND	ND	ND	1.6
Tetrahydrofuran	8,800	2,100	5.90E+05	1.47E+05	2.7	2.6	3	ND	ND	2.5	1.2	ND	2	4.7
Benzene	1.6	0.31	3.19E+03	1.60E+03	**10**	**10**	**16**	ND	1.1	**11**	ND	1.5	**6.1**	**6.2**
Toluene	22,000	5,200	7.54E+05	7.54E+04	3.7	3.3	3.4	1.7	1.6	2	ND	1.1	2.6	1.6
n-Octane	NA	NA	2.34E+06	1.40E+06	ND	ND	0.98	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND
Ethylbenzene	4.9	0.97	4.34E+05	8.68E+04	0.72	0.83	0.91	ND	ND	ND	ND	ND	ND	ND
m,p-Xylenes	440	100	4.34E+05	4.34E+05	1.5	1.7	3.2	ND	ND	ND	ND	ND	ND	ND
0-Xylene	440	100	4.34E+05	4.34E+05	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND
n-Nonane	880	210	1.05E+06	1.05E+06	ND	ND	0.87	ND	ND	ND	ND	ND	ND	ND
Alpha-Pinene	NA	NA	5.57E+05	1.11E+05	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND
d-Limonene	NA	NA	1.67E+05 (AIHA WEEL)		0.99	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tentatively Identified Compounds	**RSL Ind.**	**RSL Res.**	**OSHA PEL**	**ACGIH TLV**	**Pond Center**	**Pond East**	**Pond West**	**Summit**	**Amphi-theater**	**East Fenceline #1**	**East Fenceline #2**	**South Fenceline #1**	**South Fenceline #2**	**Summit Valley**
Furan	NA	NA	——	——	3.4	4.7	ND	ND	ND	3.5	ND	ND	ND	13
Dimethyl sulfide	NA	NA	——	2.54E+04	4.5	4.4	2.8	ND	ND	5.2	ND	ND	ND	12
Methyl acetate	NA	NA	6.06E+05	6.06E+05	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
2-Methylfuran	NA	NA	——	——	3.7	5.4	ND	ND	ND	3.9	ND	ND	ND	14
Methyl propionate	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5
Methyl butyrate	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	12
Isobutene	NA	NA	——	——	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND
C6-H10 Alkene (13.0 RT)	NA	NA	——	——	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6
Unidentified (9.41 RT)	NA	NA	——	——	4.1	4	3.3	ND	ND	3.1	ND	ND	ND	ND
Ethyl propionate	NA	NA	——	——	14	7.1	11	9.9	4.1	ND	ND	ND	ND	ND
Ethyl butyrate	NA	NA	——	——	14	8.4	11	9.7	5.9	3.9	ND	4.9	ND	4.5
Hexamethylcyclotrisiloxane	NA	NA	——	——	12	3.5	3.4	ND	ND	15	ND	ND	ND	ND
2-Ethyl-1-hexanol	NA	NA	——	——	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetic acid	NA	NA	2.46E+04	3.68E+04	ND	4.7	ND	ND	ND	ND	ND	ND	ND	ND
2-Butoxyethanol	NA	NA	2.42E+05	——	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND
Isopentane	NA	NA	——	——	ND	ND	ND	ND	4.9	ND	ND	ND	ND	ND

Aldehydes	RSL Ind.	RSL Res.	OSHA PEL	ACGIH TLV	Pond Center	Pond East	Pond West	Summit	Amphi-theater	East Fenceline #1	East Fenceline #2	South Fenceline #1	South Fenceline #2	Summit Valley
Formaldehyde	**0.94**	**0.19**	9.21E+02	3.68E+02	6.3	6.2	6.2	6.1	ND	ND	ND	1.5	1.7	NS
Acetaldehyde	**5.6**	**1.1**	3.31E+04	4.50E+04	1.7	1.5	1.6	1.5	19	10	8.3	1.1	1.5	NS
Valeraldehyde	NA	NA	——	1.76E+05	0.47	0.62	0.46	ND	ND	ND	ND	ND	0.47	NS
2,5-Dimethylbenzaldehyde	NA	NA	——	——	0.94	0.91	0.86	0.9	ND	ND	ND	ND	0.94	NS
Reduced Sulfur Compounds	**RSL Ind.**	**RSL Res.**	**OSHA PEL**	**ACGIH TLV**	**Pond Center**	**Pond East**	**Pond West**	**Summit**	**Amphi-theater**	**East Fenceline #1**	**East Fenceline #2**	**South Fenceline #1**	**South Fenceline #2**	**Summit Valley**
Dimethyl sulfide	NA	NA	——	1.93E+03	NS	NS	NS	NS	NS	19	NS	NS	33	NS
PAHs	**RSL Ind.**	**RSL Res.**	**OSHA PEL**	**ACGIH TLV**	**Pond Center**	**Pond East**	**Pond West**	**Summit**	**Amphi-theater**	**East Fenceline #1**	**East Fenceline #2**	**South Fenceline #1**	**South Fenceline #2**	**Summit Valley**
Naphthalene	0.36	0.072	5.24E+04	5.24E+04	NS	NS	NS	0.089	NS	0.029	NS	NS	NS	NS
Acenaphthene	NA	NA	——	——	NS	NS	NS	0.0076	NS	0.004	NS	NS	NS	NS
Fluorene	NA	NA	——	——	NS	NS	NS	0.0089	NS	0.0038	NS	NS	NS	NS
Phenanthrene	NA	NA	200	200	NS	NS	NS	0.023	NS	0.011	NS	NS	NS	NS
Fluoranthene	NA	NA	200	200	NS	NS	NS	0.004	NS	0.0021	NS	NS	NS	NS
Pyrene	NA	NA	200	200	NS	NS	NS	0.002	NS	ND	NS	NS	NS	NS
TCDD TEQ	3.2E-07	6.4E-08	2.0E-04 (Leung HW)		--	--	--	1.49E-08	--	7.88E-09	--	--	--	--

RSL: US EPA Regional Screening Level Summary Table April/May 2012; Industrial Exposure; Residential Exposure

OSHA PEL: Permissible Exposure Limit for occupational exposure (enforceable)

ACGIH TLV: Threshold Limit Value for occupational exposure (guideline)

TCDD TEQ: 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin Toxicity Equivalent Concentration. US EPA, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2, 3. 7, 8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds*, EPA/100/R 10/005. December 2010.

Table 3
All Analytes Detected in Air Samples from Upwind (Background) Locations

Volatile Organic Compounds	Concentrations in μg/m³									
	RSL Ind.	RSL Res.	OSHA PEL	ACGIH TLV	Grassy Knoll Center (1)	Grassy Knoll Center (2)	Grassy Knoll West (1)	Grassy Knoll West (2)	Grassy Knoll North (1)	Grassy Knoll North (2)
Dichlorofluoromethane	440	100	4.21E+06	4.21E+06	2.1	2.1	2.2	2.2	2.2	2.2
Acetonitrile	260	63	6.72E+04	3.36E+04	ND	0.78	ND	ND	ND	0.88
Acetone	140,000	32,000	2.86E+06	1.19E+06	12	ND	13	ND	21	ND
Trichlorofluoromethane	3,100	730	5.62E+06	5.62E+06	1.1	1.1	1.2	1.1	1.1	1.1
Ethyl acetate	NA	NA	1.44E+06	1.44E+06	2.6	ND	3	ND	2.7	ND
Toluene	22,000	5,200	7.54E+-5	7.54E+04	1	ND	1.4	ND	1.1	ND
Tetrachloroethene	47	9.4	6.78E+05	1.70E+05	1.4	ND	ND	1.8	ND	ND
Tentatively Identified Compounds	**RSL Ind.**	**RSL Res.**	**OSHA PEL**	**ACGIH TLV**	**Grassy Knoll Center (1)**	**Grassy Knoll Center (2)**	**Grassy Knoll West (1)**	**Grassy Knoll West (2)**	**Grassy Knoll North (1)**	**Grassy Knoll North (2)**
Unidentified (9.41 RT)	NA	NA	--	--	3.3	ND	ND	ND	4.6	ND
Ethyl propionate	NA	NA	--	--	5	ND	4.7	ND	5.2	ND
Ethyl butyrate	NA	NA	--	--	7.6	5.4	6.5	ND	7.9	ND
Hexamethylcyclotrisiloxane	NA	NA	--	--	3.3	ND	ND	ND	12	ND
Acetic acid	NA	NA	2.46E+-4	3.68E+04	ND	ND	3.7	ND	ND	ND
Aldehydes	**RSL Ind.**	**RSL Res.**	**OSHA PEL**	**ACGIH TLV**	**Grassy Knoll Center (1)**	**Grassy Knoll Center (2)**	**Grassy Knoll West (1)**	**Grassy Knoll West (2)**	**Grassy Knoll North (1)**	**Grassy Knoll North (2)**
Benzaldehyde	NA	NA	8.69E+3		ND	ND	ND	ND	3.4	ND
Formaldehyde	0.94	0.19	9.21E+02	3.68E+02	ND	2.9	ND	3.1	ND	3.2
Acetaldehyde	5.6	1.1	3.31E+04	4.50E+04	17	1.3	19	1.2	18	1.2
2,5-Dimethylbenzaldehyde	NA	NA	--	1.76E+05	ND	0.41	ND	0.51	ND	0.81
TCDD TEQ	3.2E-07	6.4E-08	2.0E-04 (Leung HW)		1.94E-08	--	--	--	--	--

Note: (1) Samples collected on 8/16/2012
(2) Samples collected on 8/17/2012

RSL: US EPA Regional Screening Level Summary Table April/May 2012; Industrial Exposure; Residential Exposure

OSHA PEL: Permissible Exposure Limit for occupational exposure (enforceable)

ACGIH TLV: Threshold Limit Value for occupational exposure (guideline)

TCDD TEQ: 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin Toxicity Equivalent Concentration. US EPA, *Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds*, EPA/100/R 10/005. December 2010.

Doug Mendoza

Bridgeton Landfill
1993803000

From:	Nora C. Estopare
Sent:	Friday, November 30, 2012 3:51 PM
To:	Larry.Lehman@dnr.mo.gov; Dan.Norris@dnr.mo.gov
Cc:	Ryan Sabourin; Christopher J. Bulmahn; Doug Mendoza; Rob G Daly
Subject:	Bridgeton Landfill Information Request
Attachments:	Bridgeton Landfill results.pdf

Mr. Lehman,
Thank you for taking the time to speak with me on the telephone yesterday. As I indicated during our conversation, MSD would like to request a copy of all monitoring results as related to MDNR's recent sampling of the Bridgeton Landfill.

MSD operates and maintains a pump station that the Bridgeton Landfill discharges to. In the late spring months of 2012, MSD workers noted odor issues in this pump station building. High levels of methane, hydrogen sulfide, and carbon monoxide were measured with 4-gas meter equipment routinely used by MSD workers. Currently, the odor issues continue to be problematic even after ventilation and 4-gas meter equipment indicates the pump station building is safe for entry.

During October 2012, MSD conducted a special sampling effort outside of normal quarterly sampling of the Bridgeton Landfill. Water samples were collected from the 14" pipe discharging from the Bridgeton Landfill into the pump station wetwell. The analytical results are attached. The landfill has historically discharged Total Phenols at concentrations of 2-5 mg/L. The October 2012 sample results measured Total Phenols at concentrations of 38-78 mg/L.

After you have had a chance to review this information, MSD would also be interested having a conference call with yourself and Mr. Dan Norris. Please forward times when you would be available.

Best Regards,
Nora

Nora C. Estopare, P.E.
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8742

MSD Special Sampling Results for
BRIDGETON LANDFILL LLC [1003803000]

DATE	SP	POLLUTANT		RESULT	UNIT
10/11/12	007	pH		6.16	SU
10/11/12	007	Temperature		27.3	Deg C
10/11/12	007	Total Phenols		53.93	mg/L
10/11/12	007	1,2,4-Trichlorobenzene	<	10	ug/L
10/11/12	007	1,2-Dichlorobenzene	<	10	ug/L
10/11/12	007	1,2-Diphenylhydrazine	<	10	ug/L
10/11/12	007	1,3-Dichlorobenzene	<	10	ug/L
10/11/12	007	1,4-Dichlorobenzene	<	10	ug/L
10/11/12	007	2,4,6-Trichlorophenol	<	100	ug/L
10/11/12	007	2,4-Dichlorophenol	<	100	ug/L
10/11/12	007	2,4-Dimethylphenol	<	100	ug/L
10/11/12	007	2,4-Dinitrophenol	<	2000	ug/L
10/11/12	007	2,4-Dinitrotoluene	<	10	ug/L
10/11/12	007	2,6-Dinitrotoluene	<	10	ug/L
10/11/12	007	2-Chloronaphthalene	<	10	ug/L
10/11/12	007	2-Chlorophenol	<	100	ug/L
10/11/12	007	2-Nitrophenol	<	100	ug/L
10/11/12	007	3,3-Dichlorobenzidine	<	10	ug/L
10/11/12	007	4,6-Dinitro-2-Methylphenol	<	780	ug/L
10/11/12	007	4-Bromophenyl phenyl ether	<	10	ug/L
10/11/12	007	4-Chloro-3-Methylphenol	<	100	ug/L
10/11/12	007	4-Chlorophenyl phenyl ether	<	10	ug/L
10/11/12	007	4-Nitrophenol	<	250	ug/L
10/11/12	007	Acenaphthene		12	ug/L
10/11/12	007	Acenaphthylene	<	10	ug/L
10/11/12	007	Anthracene		44.1	ug/L
10/11/12	007	Benzidine	<	80	ug/L
10/11/12	007	Benzo (A) Anthracene	<	10	ug/L
10/11/12	007	Benzo (A) Pyrene	<	10	ug/L
10/11/12	007	Benzo (B) Fluoranthene	<	10	ug/L
10/11/12	007	Benzo (G,H,I) Perylene	<	10	ug/L
10/11/12	007	Benzo (K) Fluoranthene	<	10	ug/L
10/11/12	007	Bis (2-Chloroethoxy) Methane	<	10	ug/L
10/11/12	007	Bis (2-Chloroethyl) Ether	<	10	ug/L
10/11/12	007	Bis (2-Chloroisopropyl) Ether	<	10	ug/L
10/11/12	007	Bis (2-EthylHexyl) Phthalate		16.2	ug/L
10/11/12	007	Butylbenzyl Phthalate	<	10	ug/L
10/11/12	007	Chrysene	<	10	ug/L
10/11/12	007	Dibenzo (A,H) Anthracene	<	10	ug/L
10/11/12	007	Diethyl Phthalate	<	10	ug/L
10/11/12	007	Dimethyl Phthalate	<	10	ug/L
10/11/12	007	Di-n-butyl Phthalate		14.6	ug/L
10/11/12	007	Di-n-octyl Phthalate	<	10	ug/L
10/11/12	007	Fluoranthene	<	10	ug/L
10/11/12	007	Fluorene		13.2	ug/L
10/11/12	007	Hexachlorobenzene	<	10	ug/L
10/11/12	007	Hexachlorobutadiene	<	2	ug/L
10/11/12	007	Hexachlorocyclopentadiene	<	2	ug/L
10/11/12	007	Hexachloroethane	<	10	ug/L
10/11/12	007	Indeno (1,2,3-cd) pyrene	<	10	ug/L
10/11/12	007	Isophorone	<	10	ug/L
10/11/12	007	Naphthalene		61.3	ug/L
10/11/12	007	Nitrobenzene	<	10	ug/L
10/11/12	007	N-Nitrosodimethylamine	<	10	ug/L
10/11/12	007	N-Nitrosodi-n-Propylamine	<	10	ug/L
10/11/12	007	N-Nitrosodiphenylamine	<	10	ug/L
10/11/12	007	Pentachlorophenol	<	250	ug/L
10/11/12	007	Phenanthrene		26.4	ug/L
10/11/12	007	Phenol		10522	ug/L
10/11/12	007	Pyrene	<	10	ug/L

MSD Special Sampling Results for
BRIDGETON LANDFILL LLC [1003803000]

DATE	SP	POLLUTANT		RESULT	UNIT
10/10/12	007	pH		6.23	SU
10/10/12	007	Temperature		21.3	Deg C
10/10/12	007	Total Phenols		60.65	mg/L
10/10/12	007	1,2,4-Trichlorobenzene	<	10	ug/L
10/10/12	007	1,2-Dichlorobenzene	<	10	ug/L
10/10/12	007	1,2-Diphenylhydrazine	<	10	ug/L
10/10/12	007	1,3-Dichlorobenzene	<	10	ug/L
10/10/12	007	1,4-Dichlorobenzene		49.2	ug/L
10/10/12	007	2,4,6-Trichlorophenol	<	100	ug/L
10/10/12	007	2,4-Dichlorophenol	<	100	ug/L
10/10/12	007	2,4-Dimethylphenol	<	100	ug/L
10/10/12	007	2,4-Dinitrophenol	<	2000	ug/L
10/10/12	007	2,4-Dinitrotoluene	<	10	ug/L
10/10/12	007	2,6-Dinitrotoluene	<	10	ug/L
10/10/12	007	2-Chloronaphthalene	<	10	ug/L
10/10/12	007	2-Chlorophenol	<	100	ug/L
10/10/12	007	2-Nitrophenol	<	100	ug/L
10/10/12	007	3,3-Dichlorobenzidine	<	10	ug/L
10/10/12	007	4,6-Dinitro-2-Methylphenol	<	780	ug/L
10/10/12	007	4-Bromophenyl phenyl ether	<	10	ug/L
10/10/12	007	4-Chloro-3-Methylphenol	<	100	ug/L
10/10/12	007	4-Chlorophenyl phenyl ether	<	10	ug/L
10/10/12	007	4-Nitrophenol	<	250	ug/L
10/10/12	007	Acenaphthene		18.6	ug/L
10/10/12	007	Acenaphthylene	<	10	ug/L
10/10/12	007	Anthracene	<	10	ug/L
10/10/12	007	Benzidine	<	80	ug/L
10/10/12	007	Benzo (A) Anthracene	<	10	ug/L
10/10/12	007	Benzo (A) Pyrene	<	10	ug/L
10/10/12	007	Benzo (B) Fluoranthene	<	10	ug/L
10/10/12	007	Benzo (G,H,I) Perylene	<	10	ug/L
10/10/12	007	Benzo (K) Fluoranthene	<	10	ug/L
10/10/12	007	Bis (2-Chloroethoxy) Methane	<	10	ug/L
10/10/12	007	Bis (2-Chloroethyl) Ether	<	10	ug/L
10/10/12	007	Bis (2-Chloroisopropyl) Ether	<	10	ug/L
10/10/12	007	Bis (2-EthylHexyl) Phthalate		16.1	ug/L
10/10/12	007	Butylbenzyl Phthalate	<	10	ug/L
10/10/12	007	Chrysene	<	10	ug/L
10/10/12	007	Dibenzo (A,H) Anthracene	<	10	ug/L
10/10/12	007	Diethyl Phthalate	<	10	ug/L
10/10/12	007	Dimethyl Phthalate	<	10	ug/L
10/10/12	007	Di-n-butyl Phthalate		16.6	ug/L
10/10/12	007	Di-n-octyl Phthalate	<	10	ug/L
10/10/12	007	Fluoranthene	<	10	ug/L
10/10/12	007	Fluorene	<	10	ug/L
10/10/12	007	Hexachlorobenzene	<	10	ug/L
10/10/12	007	Hexachlorobutadiene	<	2	ug/L
10/10/12	007	Hexachlorocyclopentadiene	<	2	ug/L
10/10/12	007	Hexachloroethane	<	10	ug/L
10/10/12	007	Indeno (1,2,3-cd) pyrene	<	10	ug/L
10/10/12	007	Isophorone	<	10	ug/L
10/10/12	007	Naphthalene		71.4	ug/L
10/10/12	007	Nitrobenzene	<	10	ug/L
10/10/12	007	N-Nitrosodimethylamine	<	10	ug/L
10/10/12	007	N-Nitrosodi-n-Propylamine	<	10	ug/L
10/10/12	007	N-Nitrosodiphenylamine	<	10	ug/L
10/10/12	007	Pentachlorophenol	<	250	ug/L
10/10/12	007	Phenanthrene		35.1	ug/L
10/10/12	007	Phenol		8163.4	ug/L
10/10/12	007	Pyrene	<	10	ug/L

MSD Special Sampling Results for
BRIDGETON LANDFILL LLC [1003803000]

DATE	SP	POLLUTANT		RESULT	UNIT
10/05/12	007	1,2,4-Trichlorobenzene	<	50	ug/L
10/05/12	007	1,2-Dichlorobenzene	<	50	ug/L
10/05/12	007	1,2-Diphenylhydrazine	<	50	ug/L
10/05/12	007	1,3-Dichlorobenzene	<	50	ug/L
10/05/12	007	1,4-Dichlorobenzene	<	50	ug/L
10/05/12	007	2,4,6-Trichlorophenol	<	50	ug/L
10/05/12	007	2,4-Dichlorophenol	<	50	ug/L
10/05/12	007	2,4-Dimethylphenol	<	50	ug/L
10/05/12	007	2,4-Dinitrophenol	<	1000	ug/L
10/05/12	007	2,4-Dinitrotoluene	<	50	ug/L
10/05/12	007	2,6-Dinitrotoluene	<	50	ug/L
10/05/12	007	2-Chloronaphthalene	<	50	ug/L
10/05/12	007	2-Chlorophenol	<	50	ug/L
10/05/12	007	2-Nitrophenol	<	50	ug/L
10/05/12	007	3,3-Dichlorobenzidine	<	50	ug/L
10/05/12	007	4,6-Dinitro-2-Methylphenol	<	390	ug/L
10/05/12	007	4-Bromophenyl phenyl ether	<	50	ug/L
10/05/12	007	4-Chloro-3-Methylphenol	<	50	ug/L
10/05/12	007	4-Chlorophenyl phenyl ether	<	50	ug/L
10/05/12	007	4-Nitrophenol	<	125	ug/L
10/05/12	007	Acenaphthene	<	50	ug/L
10/05/12	007	Acenaphthylene	<	50	ug/L
10/05/12	007	Anthracene	<	50	ug/L
10/05/12	007	Benzidine	<	400	ug/L
10/05/12	007	Benzo (A) Anthracene	<	50	ug/L
10/05/12	007	Benzo (A) Pyrene	<	50	ug/L
10/05/12	007	Benzo (B) Fluoranthene	<	50	ug/L
10/05/12	007	Benzo (G,H,I) Perylene	<	50	ug/L
10/05/12	007	Benzo (K) Fluoranthene	<	50	ug/L
10/05/12	007	Bis (2-Chloroethoxy) Methane	<	50	ug/L
10/05/12	007	Bis (2-Chloroethyl) Ether	<	50	ug/L
10/05/12	007	Bis (2-Chloroisopropyl) Ether	<	50	ug/L
10/05/12	007	Bis (2-EthylHexyl) Phthalate	<	50	ug/L
10/05/12	007	Butylbenzyl Phthalate	<	50	ug/L
10/05/12	007	Chrysene	<	50	ug/L
10/05/12	007	Dibenzo (A,H) Anthracene	<	50	ug/L
10/05/12	007	Diethyl Phthalate	<	50	ug/L
10/05/12	007	Dimethyl Phthalate	<	50	ug/L
10/05/12	007	Di-n-butyl Phthalate	<	50	ug/L
10/05/12	007	Di-n-octyl Phthalate	<	50	ug/L
10/05/12	007	Fluoranthene	<	50	ug/L
10/05/12	007	Fluorene	<	50	ug/L
10/05/12	007	Hexachlorobenzene	<	50	ug/L
10/05/12	007	Hexachlorobutadiene	<	10	ug/L
10/05/12	007	Hexachlorocyclopentadiene	<	10	ug/L
10/05/12	007	Hexachloroethane	<	50	ug/L
10/05/12	007	Indeno (1,2,3-cd) pyrene	<	50	ug/L
10/05/12	007	Isophorone	<	50	ug/L
10/05/12	007	Naphthalene	<	50	ug/L
10/05/12	007	Nitrobenzene	<	50	ug/L
10/05/12	007	N-Nitrosodimethylamine	<	50	ug/L
10/05/12	007	N-Nitrosodi-n-Propylamine	<	50	ug/L
10/05/12	007	N-Nitrosodiphenylamine	<	50	ug/L
10/05/12	007	Pentachlorophenol	<	125	ug/L
10/05/12	007	Phenanthrene	<	50	ug/L
10/05/12	007	Phenol	<	50	ug/L
10/05/12	007	Pyrene	<	50	ug/L
10/05/12	007	pH		6.38	SU
10/05/12	007	Temperature		15.7	Deg C
10/05/12	007	Total Phenols		77.85	mg/L

MSD Special Sampling Results for
BRIDGETON LANDFILL LLC [1003803000]

DATE	SP	POLLUTANT		RESULT	UNIT
10/04/12	007	1,2,4-Trichlorobenzene	<	100	ug/L
10/04/12	007	1,2-Dichlorobenzene	<	100	ug/L
10/04/12	007	1,2-Diphenylhydrazine	<	100	ug/L
10/04/12	007	1,3-Dichlorobenzene	<	100	ug/L
10/04/12	007	1,4-Dichlorobenzene	<	100	ug/L
10/04/12	007	2,4,6-Trichlorophenol	<	100	ug/L
10/04/12	007	2,4,6-Trichlorophenol	<	100	ug/L
10/04/12	007	2,4-Dichlorophenol	<	100	ug/L
10/04/12	007	2,4-Dichlorophenol	<	100	ug/L
10/04/12	007	2,4-Dimethylphenol	<	100	ug/L
10/04/12	007	2,4-Dimethylphenol	<	100	ug/L
10/04/12	007	2,4-Dinitrophenol	<	2000	ug/L
10/04/12	007	2,4-Dinitrophenol	<	2000	ug/L
10/04/12	007	2,4-Dinitrotoluene	<	100	ug/L
10/04/12	007	2,6-Dinitrotoluene	<	100	ug/L
10/04/12	007	2-Chloronaphthalene	<	100	ug/L
10/04/12	007	2-Chlorophenol	<	100	ug/L
10/04/12	007	2-Chlorophenol	<	100	ug/L
10/04/12	007	2-Nitrophenol	<	100	ug/L
10/04/12	007	2-Nitrophenol	<	100	ug/L
10/04/12	007	3,3-Dichlorobenzidine	<	100	ug/L
10/04/12	007	4,6-Dinitro-2-Methylphenol	<	780	ug/L
10/04/12	007	4,6-Dinitro-2-Methylphenol	<	780	ug/L
10/04/12	007	4-Bromophenyl phenyl ether	<	100	ug/L
10/04/12	007	4-Chloro-3-Methylphenol	<	100	ug/L
10/04/12	007	4-Chloro-3-Methylphenol	<	100	ug/L
10/04/12	007	4-Chlorophenyl phenyl ether	<	100	ug/L
10/04/12	007	4-Nitrophenol	<	250	ug/L
10/04/12	007	4-Nitrophenol	<	250	ug/L
10/04/12	007	Acenaphthene	<	100	ug/L
10/04/12	007	Acenaphthylene	<	100	ug/L
10/04/12	007	Ammonia (as N)		700	mg/L
10/04/12	007	Anthracene	<	100	ug/L
10/04/12	007	Antimony (Total)	<	0.024	mg/L
10/04/12	007	Arsenic (Total)	<	0.008	mg/L
10/04/12	007	Benzidine	<	800	ug/L
10/04/12	007	Benzo (A) Anthracene	<	100	ug/L
10/04/12	007	Benzo (A) Pyrene	<	100	ug/L
10/04/12	007	Benzo (B) Fluoranthene	<	100	ug/L
10/04/12	007	Benzo (G,H,I) Perylene	<	100	ug/L
10/04/12	007	Benzo (K) Fluoranthene	<	100	ug/L
10/04/12	007	Beryllium (Total)	<	0.0006	mg/L
10/04/12	007	Biochemical Oxygen Demand (5 Day)		19000	mg/L
10/04/12	007	Bis (2-Chloroethoxy) Methane	<	100	ug/L
10/04/12	007	Bis (2-Chloroethyl) Ether	<	100	ug/L
10/04/12	007	Bis (2-Chloroisopropyl) Ether	<	100	ug/L
10/04/12	007	Bis (2-EthylHexyl) Phthalate	<	100	ug/L
10/04/12	007	Butylbenzyl Phthalate	<	100	ug/L
10/04/12	007	Cadmium (Total)	<	0.009	mg/L
10/04/12	007	Chemical Oxygen Demand		32800	mg/L
10/04/12	007	Chromium (Total)	<	0.01	mg/L
10/04/12	007	Chrysene	<	100	ug/L
10/04/12	007	Copper (Total)	<	0.009	mg/L
10/04/12	007	Cyanide Amenable to Chlorination	<	0.02	mg/L
10/04/12	007	Dibenzo (A,H) Anthracene	<	100	ug/L
10/04/12	007	Diethyl Phthalate	<	100	ug/L
10/04/12	007	Dimethyl Phthalate	<	100	ug/L
10/04/12	007	Di-n-butyl Phthalate	<	100	ug/L
10/04/12	007	Di-n-octyl Phthalate	<	100	ug/L
10/04/12	007	Fluoranthene	<	100	ug/L
10/04/12	007	Fluorene	<	100	ug/L
10/04/12	007	Hexachlorobenzene	<	100	ug/L

MSD Special Sampling Results for
BRIDGETON LANDFILL LLC [1003803000]

DATE	SP	POLLUTANT		RESULT	UNIT
10/04/12	007	Hexachlorobutadiene	<	20	ug/L
10/04/12	007	Hexachlorocyclopentadiene	<	20	ug/L
10/04/12	007	Hexachloroethane	<	100	ug/L
10/04/12	007	Indeno (1,2,3-cd) pyrene	<	100	ug/L
10/04/12	007	Isophorone	<	100	ug/L
10/04/12	007	Lead (Total)	<	0.02	mg/L
10/04/12	007	Mercury (Total)	<	0.0003	mg/L
10/04/12	007	Naphthalene	<	100	ug/L
10/04/12	007	Nickel (Total)	<	0.04	mg/L
10/04/12	007	Nitrobenzene	<	100	ug/L
10/04/12	007	N-Nitrosodimethylamine	<	100	ug/L
10/04/12	007	N-Nitrosodi-n-Propylamine	<	100	ug/L
10/04/12	007	N-Nitrosodiphenylamine	<	100	ug/L
10/04/12	007	Oil and Grease (Total)		19.3	mg/L
10/04/12	007	Pentachlorophenol	<	250	ug/L
10/04/12	007	Pentachlorophenol	<	250	ug/L
10/04/12	007	pH		6.47	SU
10/04/12	007	Phenanthrene	<	100	ug/L
10/04/12	007	Phenol	<	100	ug/L
10/04/12	007	Phenol	<	100	ug/L
10/04/12	007	Pyrene	<	100	ug/L
10/04/12	007	Selenium (Total)	<	0.006	mg/L
10/04/12	007	Silver (Total)	<	0.006	mg/L
10/04/12	007	Temperature		27.5	Deg C
10/04/12	007	Thallium (Total)	<	0.0018	mg/L
10/04/12	007	Total Phenols		38.14	mg/L
10/04/12	007	Total Suspended Solids		616	mg/L
10/04/12	007	Zinc (Total)		2.94	mg/L

Metropolitan St. Louis Sewer District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

November 29, 2012

Dave Vasbinder, Environmental Manager
BRIDGETON LANDFILL LLC
13570 St. Charles Rock Rd.
Bridgeton, MO 63044

RE: WASTEWATER DISCHARGE PERMIT NO. 0511559802 - 2
For premise: 3570 St. Charles Rk. Rd., 63044

Dear Mr. Vasbinder:

As discussed with Bryan Sehie in our telephone conversations on 11/14/12 and 11/16/12, MSD personnel recently collected and analyzed samples of wastewater discharged to the MSD system from the premise above. The four results (10/04/12, 10/05/12, 10/10/12 and 10/11/12) for Total Phenols that were presented in the table on the 11/02/12 letter are not to be considered exceedances of Ordinance Limitations. Please understand that each of the instances detailed on that letter would have been considered a violation if Method 420.1 would have been done in isolation without the 625 data being available. The semi-volatile organics results from Method 625 take precedence when both Methods 420.1 and 625 are conducted on the same sample.

However, after evaluation of the Method 625 results from these sampling events, the following two are exceedances of our Total Toxic Organics limit.

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	DISCHARGE LIMIT	LIMIT TYPE	VALUE FOUND
10/10/12	**1003**	**007**	**Grab**	**TTO**	**5.844 mg/L**	**IN**	**8.3704 mg/L****
10/11/12	**1108**	**007**	**Grab**	**TTO**	**5.844 mg/L**	**IN**	**10.7097 mg/L*****

007 = 14" pipe into Westlink Pump Station Wetwell, on S side
IN = Instantaneous
mg/L = milligrams per liter
TTO = Total Toxic Organics

Certain volatile chemical compounds were found at elevated levels as indicated below:

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	GAS/VAPOR TOXIC SCREENING LEVEL	VALUE FOUND
10/10/12	0928	007	24 hr Comp	Acenaphthene	N/A	0.0186 mg/L
10/10/12	0928	007	24 hr Comp	Bis(2-ethylhexyl) phthalate	1198 mg/L	0.0161 mg/L
10/10/12	0928	007	24 hr Comp	Di-n-butyl phthalate	N/A	0.0166 mg/L
10/10/12	0928	007	24 hr Comp	1,4-Dichlorobenzene	3.55 mg/L	0.0492 mg/L
10/10/12	0928	007	24 hr Comp	Naphthalene	2.65 mg/l	0.0714 mg/L
10/10/12	0928	007	24 hr Comp	Phenanthrene	N/A	0.0351 mg/L
10/10/12	0928	007	24 hr Comp	Phenol	1024 mg/L	8.1634 mg/L
10/11/12	0952	007	24 hr Comp	Acenaphthene	N/A	0.012 mg/L
10/11/12	0952	007	24 hr Comp	Anthracene	N/A	0.0441 mg/L
10/11/12	0952	007	24 hr Comp	Bis(2-ethylhexyl) phthalate	1198 mg/L	0.0162 mg/L
10/11/12	0952	007	24 hr Comp	Di-n-butyl phthalate	N/A	0.0162 mg/L
10/11/12	0952	007	24 hr Comp	Fluorene	N/A	0.0132 mg/L
10/11/12	0952	007	24 hr Comp	Naphthalene	2.65 mg/l	0.0613 mg/L
10/11/12	0952	007	24 hr Comp	Phenanthrene	N/A	0.0264 mg/L
10/11/12	0952	007	24 hr Comp	Phenol	1024 mg/L	10.522 mg/L

Any other toxic organic chemicals which are or may be present in your discharge returned analytical values less than the minimum reporting level.

Wastewater discharges <u>are prohibited</u> under Ordinance 12559, Article V, Section One.A.8 if they cause or contribute to emissions of toxic gases, vapors, or fumes into the sewer atmosphere at levels in excess of applicable exposure levels. The presence of volatile chemical compounds at concentrations above the screening levels can result in the generation of toxic gases or vapors in the sewer atmosphere. Such conditions pose a serious threat to the health and safety of MSD personnel and to other users of the sewer system. If several compounds are present at elevated levels, the potential for the generation of toxic gases or vapors increases due to possible additive and/or synergistic effects.

For those entities that are compelled to self-monitor for phenolic compounds under an MSD Permit, we have addressed this issue with the following Special Condition.

Sampling/Reporting Requirement for Ordinance Total Phenols

Analysis for Total Phenols is to be performed using EPA Method 625. The result to be reported is the arithmetic sum of the concentrations found for the following individual phenolic compounds:

4-chloro-3-methylphenol	4,6-dinitro-2-methylphenol	pentachlorophenol
2-chlorophenol	2,4-dinitrophenol	phenol
2,4-dichlorophenol	2-nitrophenol	2,4,6-trichlorophenol
2,4-dimethylphenol	4-nitrophenol	

As an option, prior to performing the Method 625 analysis, an initial screening may be performed using EPA Method 420.1. If this option is chosen, two separate samples must be collected, one preserved for the method 420.1 analysis and one unpreserved for a method 625 analysis, if necessary. If the screening produces a result which is less than the permit limitation for Total Phenols, the result should be reported as "less than (numerical result)", and the Method 625 analysis need not be performed. If Method 420.1 produces a result which is greater than the permit limitation, the unpreserved sample must be analyzed using Method 625 and the Method 625 result must be reported. Note: The screening analysis must be completed and a result obtained within sufficient time to ensure the Method 625 analysis, if required, can begin within the 7 day holding time of the unpreserved sample.

In the interest of being consistent across all industries, permitted or not, we should have evaluated this data according to the above Special Condition. Below you will see the summation of the 11 phenolic compounds listed above for the sampling events on 10/04/12, 10/05/12, 10/10/12 and 10/11/12 which are not considered exceedances of Ordinance Limitations.

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	DISCHARGE LIMIT	LIMIT TYPE	VALUE FOUND
10/04/12	1000	007	22 hr Comp	Total Phenols	21 mg/L	IN	< 3.980 mg/L
10/05/12	0945	007	24 hr Comp	Total Phenols	21 mg/L	IN	< 1.990 mg/L
10/10/12	0928	007	24 hr Comp	Total Phenols	21 mg/L	IN	< 12.043 mg/L
10/11/12	0952	007	24 hr Comp	Total Phenols	21 mg/L	IN	< 14.402 mg/L

We recognize that you are already taking corrective actions under the Administrative Compliance Order issued on 10/26/12. Please keep MSD informed of your progress, as required by the order. We would like to stress that you should continue your efforts to reduce phenolic compound levels in your wastewater.

Thank you for helping us to comply with state and federal regulations. If you have any questions, please contact me at 314.436.8719.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Tom Boehm
Environmental Engineering Associate

Enclosures: SNC enclosure, SP map

cc: Doug Mendoza, MSD
Chris Bulmahn, MSD

MSD – Pump Station Division

Subject: **Westlakes PS – Site Conditions Meeting Minutes**

Date: **November 27, 2012**

Attendees:

Doug Mendoza- DEC	Mark Bright-PS Div	Jay Kniker- PS Div
Christopher Bulmahn-DEC	Rob Daly-PS Div	Tom Boehm-DEC
Nora Estopare-DEC		

1. Status of landfill response to MSD- capital improvements

DEC has received a progress report update (dated 11/13/12) from Bridgeton landfill detailing the system modifications undertaken by the landfill to attempt to affect changes to the leachate coming from the landfill and ultimately ending up in the Westlakes PS. Doug Mendoza will forward letter to Rob Daly and will continue to keep Rob Daly copied on correspondence between MSD and DEC.

Previous updates noted the following: The new vacuum system and activated charcoal system are up and running as designed. The 'vacuum system' is made up of 3 parts. 1) the original vacuum system feeding the original flare, 2) the secondary vacuum system that is directed to the same flare, and 3) the activated carbon system is a 3rd separate vacuum system. The carbon system is designed as a redundant system. If the vacuum flare system fails, in-line sensors activate a phone messaging system to notify facility personnel immediately. At that point, they can manually shut down the flare system and activate the carbon system. Weekly inspections will be done to ensure the system is in working order.

Landfill has completed installation of two separate flares whose intent is to burn off volatile elements of the air flow coming off the leachate prior to its discharge into the pump station.

Rob Daly received letter 12/27/12 and posted to PS Division shared folder.

2. Test results-water quality sampling.

DEC pulled samples of effluent entering pump station from landfill, at Operations request, and analyzed results for various chemical constituents. Testing performed over several week period in October. Results for the various organic chemicals analyzed were all at minimal or below detection levels. DEC did see high levels of total phenols. The primary concern for this level of total phenols will be the pretty strong smell.

Action item: Risk management will explore occupational safety impacts of these conditions with DEC and potentially MDNR to fully explore occupational safety issues. Goal is to schedule teleconference with DEC personnel, risk management, and potentially MDNR or other personnel to more fully explore these issues.

Action party: Ryan Sabourin- contact Nora Estopare to fully identify list of appropriate DEC personnel and set date/time/location of discussion.

Submittal date: schedule discussion by end of this week and have discussion before end of December, 2012.

3. PS System modifications-Landfill initiated

Mark Bright continues to be Operations point person interacting with landfill personnel on design, specification, and installation of condition monitoring and air filtration equipment on Westlakes PS site. Per Mark's last interaction with landfill personnel- equipment selection is almost complete and anticipates that procurement will commence in near future- with probable completion date of installation in January-February 2013.

Rob Daly notes for group that intent of this landfill system modification project is two-fold. One- staff safety. Air filtration equipment is intended to help mitigate local odor control issues MSD staff have been experiencing. Two- data collection for long term condition monitoring- to help provide information to DEC to assist in identifying continuing permit violations and to help link landfill system mods to impacts on air quality at pump station.

Action item: Once equipment selection and final specifications are wholly complete- Mark Bright will ensure that entire group receives information on sampling and data logging equipment. Goal is to ask for DEC input on following:

- Type of data collected - what information is being collected
- Periodicity of data collection - how often will data be collected and forwarded and analyzed

Action party: Mark Bright

Submittal date: determined by landfill

Action item: Schedule review session with landfill personnel and MSD parties- review intent of system modifications installed by landfill at Pump Station- and review roles and responsibilities immediately prior to startup of equipment. Items to discuss can include:

- Maintenance responsibility for equipment- procedures thereof
- Consequences of continuing violations

Action party: Rob Daly

Submittal date: To be determined

4. Short term site access plan- access standard operating procedure (SOP)

Mark Bright has completed a standard operating procedure identifying how staff will continue to routinely access site while District continues to pursue longer term program that modifies situation and reduces odor control issues long term.

Action item: Risk management to complete the review of the draft SOP. Provide input to Mark Bright.

Action party: Ryan Sabourin

Submittal date: 11/28/12

Action item: Finalize site access SOP and issue-save on Ops folder. Train staff on provisions of SOP and implement changes as needed. Schedule separate session with staff specifically assigned to station (Cummings/Bueltmann).

Action party: Mark Bright

Submittal date: 12/7/12

5. Long term corrective action plan (CAP)

30-60 days from data collection period commencement group will reconvene to review trends of data identify if further action is required on part of landfill or District.

Action item: Schedule review session.

Action party: Rob Daly

Submittal date: to be determined

If there are any revisions or requests for clarification please do not hesitate to contact me at ext 6706 or rdaly@stlmsd.com.

BRIDGETON LANDFILL, LLC

Mr. Chris Bulmahn
Environmental Engineer
Metropolitan St. Louis Sewer District
10 East Grand Avenue
St. Louis, MO 63147-2913

November 13, 2012

Dear Mr. Bulmahn:

Metropolitan St. Louis Sewer District – Administrative Compliance Order
Action Item #1 and Progress Report,
Bridgeton Landfill, LLC. Discharge Permit No. 0511559802-2

The Bridgeton Landfill, in accordance with the Metropolitan St. Louis Sewer District (MSD) Administrative Compliance Order (AO), which was signed by legal representatives of MSD and the Bridgeton Landfill, LLC and entered effect on October 29, 2012, respectfully submits this schedule of actions as outlined in the AO, Action Item #1. Additionally, on November 2, 2012 MSD issued the Bridgeton Landfill a letter detailing a series of Total Phenol samples collected at the facility effluent located within the Westlake Pump Station. Included in this Progress Report is, the facility's acknowledgement of that accord, and a summary of intention to collect additional samples.

As required per Action Item #1, the Bridgeton Landfill shall submit a schedule of actions for the design, installation, and operation of the procedures and pretreatment options identified in AO Finding #8 which states that the Bridgeton Landfill is in the process of investigation for the implementation of the following pretreatment options in which to eliminate the occurrence of future prohibited discharges at Leachate Outfall 008: a.) Installation and operation of a supplemental "enclosed" flare, as well as a supplemental "candlestick" utility flare within the landfill's gas collection and control system; b.) Design and operation of air monitoring / moving engineering controls at the landfill's outfall to the MSD sewer system within the Westlake Pump Station, and; c.) Installation and operation of a foam suppressing agent. The following table outlines current progress and planned actions to be taken at the Bridgeton Landfill in regard to the aforementioned items.

Finding No.	Proposed Option	Complete (Yes/No)	Completion Date
8a(1)	Installation and Operation of Additional Enclosed Flare	Yes	2-Oct-12
8a(2)	Installation and Operation of Supplemental Candlestick Flare	Yes	18-Jul-12
8b	Design and Operation of Air Monitoring/Moving Engineering Controls within Westlake Pump Station	No	Pending
8c	Installation and Operation of a Foam Suppression Agent	No	Pending

13570 St. Charles Rock Road
Bridgeton, MO 63044
Telephone (314) 744-8190
Fax (314) 739-2588

The Bridgeton Landfill completed the construction and testing phases of the supplemental "candlestick" flare on July 18, 2012 (Finding 8a(2)). The flare is currently fully operational, adding an additional gas extraction capacity between 1200 and 1770 scfm to the existing gas collection and control system at the facility. The candlestick flare is designed to work in tandem with the facility's existing 3500 scfm "enclosed" flare to extract gases from within the landfill waste cell and route them to thermal destruction.

After a period of construction, programming, and pilot testing the second "enclosed" flare was officially brought online on October 2, 2012. The new enclosed flare, similar to the facility's existing enclosed flare, adds another 3500 scfm of gas extraction capacity to the landfill's gas collection and control system. It is anticipated, with the combined three operational flares, that gas and odors will be better controlled and routed for thermal destruction therefore reducing potential migration into other systems at the facility and the surrounding environment. Each of the flares are operated and maintained under a site-specific program which is designed to enable landfill personnel to minimize down-time and provide peak system performance efficiency.

The design and development of the proposed air quality engineering controls, which are to be constructed and operated at the Westlake Pump Station (Finding 8b), are not complete, however progress has been made. Meetings regarding the development of a plan of action for designing and constructing these air quality engineering controls were held at the MSD office on August 21, and September 24, 2012 between; MSD Environmental Compliance representatives; MSD Operations representatives; and Bridgeton Landfill personnel. During the week of October 8, 2012 coordination of necessary materials and contractor services were initiated by the Bridgeton Landfill via telephone and email. Per these efforts a series of on-site meetings were held at the Westlake Pump Station to finalize the design of the system and to secure an incoming power supply. The Bridgeton Landfill continues to prepare for the purchase of the necessary materials to undertake the system's construction. Based on procurement time for the necessary funding, and lead times for project materials provided by the individual equipment manufacturers', the following schedule of action is anticipated:

Item	Estimated Completion Date
Underground Utility Location	15-Dec-12
Ameren Power Installation	15-Dec-12
Ordering of Air Quality Monitor	15-Dec-12
Ordering of Drum Scrubber	15-Dec-12
Ordering of Telog Call Unit	15-Dec-12
Construction of Air System	15-Feb-13

On September 17, 2012, the Bridgeton Landfill began foam production and foam suppression pilot testing at the Westlake Pump Station. Utilizing access to the Westlake Pump Station granted by MSD on September 4, 2012, landfill personnel attempted, on multiple accounts, to recreate the foaming events noted by MSD personnel on the dates of August 16 and 28, 2012 by altering flow rates to the discharge in a controlled and continuously monitored atmosphere. The foaming events observed in August 2012 were unable to be recreated. Discharge into the Westlake Pump Station wet well has also been monitored visually by Bridgeton Landfill personnel at a minimum weekly basis since access was granted. No instances of foaming were noted during these inspections.

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The Bridgeton Landfill has presented Outfall 008 analytical data to a chemical consultant, who has in turn recommended a site-specific foam suppression additive based on the recent constituent concentrations. The suppression agent is designed to be added to the wastewater discharge, in small concentrations, where it forms a thin protective layer on the water's surface within the wet well. The floating barrier increases water surface tension and therefore eliminates and prevents the additional formation of foam. A small quantity of the suppressant is maintained at the facility for testing purposes should another foaming issue arise. The Bridgeton Landfill is also preparing a design for a foam suppressant implementation system which utilizes a low-feed electric pump, placed in the leachate tank discharge control vault, should future issues require it. The Bridgeton Landfill proposes, in light of both recent wet well monitoring results and the absence of historic foam-related issues, that the necessity of installing a full time foam suppression system be eliminated. The Bridgeton Landfill will continue to monitor the Westlake Pump Station as well as the Leachate Tank System for indicators of foaming.

In a letter issued to the Bridgeton Landfill by MSD on November 2, 2012, the facility was advised that MSD personnel collected a series of grab samples at the Westlake Pump Station on the dates of October 4, 5, 10, and 11, 2012. Laboratory analytical results from this sampling reported concentrations of Total Phenols of 38.14 mg/L, 77.85 mg/L, 60.65 mg/L, and 53.93 mg/L, respectively. Each of these results was in exceedance of the District's limitations for treatment plants discharging into the Missouri and Mississippi Rivers according to MSD Ordinance No. 12559 (21 mg/L). The Bridgeton Landfill understands that, as explained in the Significant Noncompliance Enclosure provided with the letter, that a minimum of nine (9) Total Phenols samples must be collected within the confine of the six-month review period ending on December 31, 2012, and that each of the nine (9) samples must report values below the 21 mg/L limitation to avoid remaining in Significant Noncompliance status. The Bridgeton Landfill has ordered sufficient sample kits to perform the required analysis and will present the results to MSD as they are available.

Please contact David Vasbinder, Environmental Manager at 314-744-8166, or myself at 314-744-8190 if you have any questions or comments.

Sincerely,

BRIDGETON LANDFILL, LLC

Bryan K. Sehie

Bryan K. Sehie
Environmental Specialist

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Vow
TCB-
CB

Mr. Chris Bulmahn
Metropolitan St. Louis Sewer District
Department of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913

November 12, 2012

Dear Mr. Bulmahn:

Notification of Exceedance of Permitted Discharge Limitation – Zinc
Bridgeton Landfill, LLC 1003803000
Discharge Permit No. 0511559802-2

As required by Leachate Discharge Permit No. 0511559802-2, and as a follow up to a telephone conversation between Tom Boehm and myself on November 9, 2012, Bridgeton Landfill, LLC is submitting this letter of Notification of Exceedance of Permitted Discharge Limitation for one of three leachate resample collection events at Outfall 008. Leachate resamples were collected from sampling point 008 on the dates of October 15-16, October 29-30, and October 31 – November 1, 2012, as 24-hour composite samples, in accordance with the permit.

Laboratory analytical results indicate that the detected level of Zinc (6.7 mg/L) in the sample collected on October 29-30, 2012 exceeded the permitted discharge limitation of 3.0 mg/L at the time of sample collection. However, results from the other two sample collections for Zinc, which occurred on October 15-16, and October 31 – November 1, 2012, held compliant concentrations at 1.5 mg/L, and 2.3 mg/L, respectively. Included with this letter is the analytical data report provided by Heritage Environmental Services, LLC of Indianapolis, IN.

Historically the landfill leachate has contained Zinc concentrations that are within permitted discharge limitations. Further resampling of leachate from Outfall 008 for Zinc is scheduled to be conducted at the Bridgeton Landfill as soon as reasonably possible to demonstrate a return to compliance. Results obtained from these resamples will be reported to the Metropolitan St. Louis Sewer District (MSD) once they are available.

If you have any questions regarding the information provided in this letter, please contact me at 314-744-8190 at your earliest convenience.

Sincerely,
BRIDGETON LANDFILL, LLC

Bryan K. Sehie
Bryan K. Sehie
Environmental Specialist

Attachments: Heritage Environmental Services, LLC, Laboratory Analytical Reports

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13570 St. Charles Rock Road
Bridgeton, MO 63044
Telephone (314) 744-8190
Fax (314) 739-2588

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HERITAGE ENVIRONMENTAL SERVICES, LLC.
COMMERCIAL LABORATORY OPERATIONS

7901 W Morris St Indianapolis, IN 46231
www.heritage-enviro.com (800)827-4374 Fax:(317)486-5095

12354

1 of 1

Submitter Name: MO-ALLIED-BRIDGETON LANDFILL (8945)

Project Name: LEACHATE – BRIDGETON LANDFILL (5586)

Z Quote No: Z158494

PO No: 4337-12001-9 (2012)

Heritage Contact CHRISTOPHER BOYLE (317)390-3128

Sample Turn Around Time

Standard: X Rush Date __/__/__ (Mo Day Yr)

Accelerated TAT subject to Additional Charge. Date must be Accepted and Approved by Lab.

Sampled By: Bryan Sehie

Analyses Requested (Note special detection limits or methods)

Comments: Composite Sample

Date Sampled	Time Sampled	Comp	Grab	Sample ID and/or Location where your sample was taken	Sample Type (Matrix): Water, Soil, Oil, Sludge, Swipe, Other	Number of Containers	Zn	Remarks:	Lab use only Sample No.
10/15/12 10/16/12	See Remarks AM/PM	X		Leachate Outfall 008	Water	1	1	10/15/12 @ 1200, 1700 10/16/12 @ 0730, 1200	A164438
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								
	AM/PM								

Invoice: Date : 12Oct12
Custom: Z158494 1 KIT Weight : 1 LBS
Phone : (317)390-3129 COD : 0.00
Dept : DV : 0.00
Shipping : 5.49
Special : 0.38
Handling : 0.00
Total : 5.87
Svc: GND PPD
TRCK: 293776930331535

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	10/16/12 / 1330	FedEx

Received for Lab by: (Signature) [signature]

Date: 10/17/12 Time: 930 Temperature: 22.0 °C Received On Ice: Yes / No

Laboratory use only	Yes	No	NA
Custody seals intact on cooler?	✓		
C. seals intact on containers?			✓
Broken containers?		✓	
COC agree with sample labels?	✓		
Correct containers for testing?	✓		
Headspace issues acceptable?	✓		
Holding time(s) acceptable?	✓		
Preservative pH's acceptable?	✓		
Was pH left unadjusted?	✓		

Send Report To:

Co: BRIDGETON LANDFILL
Addr: 13570 ST. CHARLES ROCK RD
BRIDGETON, MO 63044
Attn: BRIAN SEHIE
Phone: (314)739-1919
Fax: (314)739-2588
email: bsehie@repubicservices.com

HERITAGE
ENVIRONMENTAL SERVICES

CERTIFICATE OF ANALYSIS

03 11-26

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, LLC COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	17-OCT-12	A964438
	Completed	**PO Number**
	24-OCT-12	4337-12001-9 (2012)
	Printed	**Sampled**
	24-OCT-12	16-OCT-12 12:00

Report To	Bill To
BRIAN SEHIE BRIDGETON LANDFILL 13570 ST. CHARLES ROCK RD BRIDGETON, MO 63044	DAVE VASBINDER ALLIED WASTE SYSTEMS 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044

Sample Description

CLIENT ID: LEACHATE OUTFALL 008
MATRIX TYPE: NON-SPECIFIC WATER
SUBMITTER: 8945 - MO-ALLIED-BRIDGETON LANDFILL
PROJECT NAME: LEACHATE - BRIDGETON LANDFILL
DATA PACKAGE #: 63752
LOCATION: BRIDGETON LANDFILL
DESCRIPTION: RESAMPLE FOR ZINC
PERMIT: 830871

FAA OR ICP ACID DIGESTION EPA 200.0

Analyst: K. KAMARA | Analysis Date: 19-OCT-12 09:00 | Instrument: PREP | Test: P129.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

ZINC ICP EPA 200.7 REV. 4.4 NELAC:Y

Analyst: J. KRAMER | Analysis Date: 20-OCT-12 01:13 | Instrument: ICP | Test: M439.3.0

Prep: FAA OR ICP ACID DIGESTION EPA 200.0 P129.2.0

Parameter	Result	Det. Limit	Units
ZINC	1500	20	ug/L

FIELD TEMPERATURE SM 2550 B-2000 NELAC:N

Analysis Date: 16-OCT-12 | Instrument: FIELD | Test: G603.1.0

Parameter	Result	Det. Limit	Units
TEMPERATURE	33.5		Degrees C

Sample Comments

Sample was not received on ice at temperature 22 C.
Sample chain of custody number 12354.

This Certificate shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested or to the sample as received by the lab. Heritage Environmental Services, LLC certifies that the test results indicated as NELAP (National Environmental Laboratory Accreditation Program) accredited (Yes for NELAP) meet all requirements of NELAP and Kansas (KDHE) unless otherwise explained or justified as to the the exact nature of the deviations.
KS ELAP / NELAP Accreditation # E-10177 Indiana SDWA C-49-01

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HERITAGE ENVIRONMENTAL SERVICES, LLC.
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Submitter Name: MO-ALLIED-BRIDGETON LANDFILL (8945)
Project Name: LEACHATE - BRIDGETON LANDFILL (5586)
Z Quote No: Z158494
PO No: 4337-12001-9 (2012)
Heritage Contact: CHRISTOPHER BOYLE (317)390-3128

Sample Turn Around Time
Standard: ✓ Rush Date ___/___/___ (Mo Day Yr)
Accelerated TAT subject to Additional Charge. Date must be Accepted and Approved by Lab.

Sampled By:

Analyses Requested (Note special detection limits or methods)

Comments: 24-hr Comp. Sample. No Temp/Cond./pH required

Date Sampled	Time Sampled	Comp	Grab	Sample ID and/or Location where your sample was taken	Sample Type (Matrix): Water, Soil, Oil, Sludge, Swipe, Other	Number of Containers	Zn	Remarks:	Lab use only Sample No.
10/29/12 10/30/12	See Remarks AM PM	X		Outfall 008 (Leachate)	W	1	1	10/29/12 -0800-1200-1724 10/30/12 -0800	M16935
10/31/12 11/1/12	✓ AM PM	X		Outfall 008 (Leachate)	W	1	1	10/31/12 - 1214, 1800 11/1/12 - 0905, 1214	✓ 936
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								
	AM PM								

```
Invoice:                    Date : 24Oct12      Shipping :   5.84
Cust: Z158494 (2) BRI Weight : 2 LBS            Special :    0.41
Phone : (317)390-3179 COD :          0.00       Handling :   0.00
Dept :                DV :           0.00       Total :      6.25
        ONO PPD
        TRCK: 793776630334470
```

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	11/1/12 1630	FedEx
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Received for Lab by: (Signature) [signature]
Date: 11/2/12 Time: 1300
Temperature: 15.2 °C
Received On Ice: Yes / ~~No~~

Laboratory use only	Yes	No	NA
Custody seals intact on cooler?	—		
C. seals intact on containers?			—
Broken containers?		—	
COC agree with sample labels?	—		
Correct containers for testing?	—		
Headspace issues acceptable?	—		
Holding time(s) acceptable?	—		
Preservative pH's acceptable?	—		
Was pH left unadjusted?	—		

Send Report To:
Co: BRIDGETON LANDFILL
Addr: 13570 ST. CHARLES ROCK RD
BRIDGETON, MO 63044
Attn: BRIAN SEHIE
Phone: (314)739-1919
Fax: (314)739-2588
email: bsehie@repubicservices.com

HERITAGE
ENVIRONMENTAL SERVICES

CERTIFICATE OF ANALYSIS

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, LLC COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-NOV-12	A965935
	Completed	**PO Number**
	06-NOV-12	4337-12001-9 (2012)
	Printed	**Sampled**
	06-NOV-12	30-OCT-12 08:00

03
11-26

Report To	Bill To
BRIAN SEHIE BRIDGETON LANDFILL 13570 ST. CHARLES ROCK RD BRIDGETON, MO 63044	DAVE VASBINDER ALLIED WASTE SYSTEMS 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044

Sample Description

CLIENT ID: OUTFALL 008 (LEACHATE)
MATRIX TYPE: NON-SPECIFIC WATER
SUBMITTER: 8945 - MO-ALLIED-BRIDGETON LANDFILL
PROJECT NAME: LEACHATE - BRIDGETON LANDFILL
DATA PACKAGE #: 63816
LOCATION: BRIDGETON LANDFILL
DESCRIPTION: RESAMPLE FOR ZINC
PERMIT: 830871

FAA OR ICP ACID DIGESTION EPA 200.0

Analyst: K. KAMARA — Analysis Date: 05-NOV-12 09:00 — Instrument: PREP — Test: P129.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

ZINC ICP EPA 200.7 REV. 4.4 — NELAC:Y

Analyst: J. KRAMER — Analysis Date: 06-NOV-12 03:40 — Instrument: ICP — Test: M439.3.0

Prep: FAA OR ICP ACID DIGESTION EPA 200.0 P129.2.0

Parameter	Result	Det. Limit	Units
ZINC	6700	20	ug/L

Sample Comments

Sample was not received on ice at temperature 15.2 C.
Sample chain of custody number 12483.

KS ELAP / NELAP Accreditation # E-10177 Indiana SDWA C-49-01

Christine Sarkan

Approved by: CHRISTINE SARKAN 06-NOV-12

RECEIVED
NOV 14 2012
DIVISION OF
ENVIRONMENTAL COMPLIANCE

HERITAGE ENVIRONMENTAL SERVICES

CERTIFICATE OF ANALYSIS

Service Location	Received	Lab ID
HERITAGE ENVIRONMENTAL SERVICES, LLC COMMERCIAL LABORATORY OPERATIONS 7901 W. MORRIS ST. INDIANAPOLIS, IN 46231 (317)243-8304	02-NOV-12	A965936
	Completed 06-NOV-12	**PO Number** 4337-12001-9 (2012)
	Printed 06-NOV-12	**Sampled** 01-NOV-12 12:14

8 11-26

Report To	Bill To
BRIAN SEHIE BRIDGETON LANDFILL 13570 ST. CHARLES ROCK RD BRIDGETON, MO 63044	DAVE VASBINDER ALLIED WASTE SYSTEMS 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044

Sample Description

CLIENT ID: OUTFALL 008 (LEACHATE)
MATRIX TYPE: NON-SPECIFIC WATER
SUBMITTER: 8945 - MO-ALLIED-BRIDGETON LANDFILL
PROJECT NAME: LEACHATE - BRIDGETON LANDFILL
DATA PACKAGE #: 63816
LOCATION: BRIDGETON LANDFILL
DESCRIPTION: RESAMPLE FOR ZINC
PERMIT: 830871

FAA OR ICP ACID DIGESTION EPA 200.0

Analyst: K. KAMARA — Analysis Date: 05-NOV-12 09:00 — Instrument: PREP — Test: P129.2.0

Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		mL
FINAL VOLUME	50		mL

ZINC ICP EPA 200.7 REV. 4.4 — NELAC:Y

Analyst: J. KRAMER — Analysis Date: 06-NOV-12 03:44 — Instrument: ICP — Test: M439.3.0
Prep: FAA OR ICP ACID DIGESTION EPA 200.0 P129.2.0

Parameter	Result	Det. Limit	Units
ZINC	2300	20	ug/L

Sample Comments

Sample was not received on ice at temperature 15.2 C.
Sample chain of custody number 12483.

This Certificate shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested or to the sample as received by the lab. Heritage Environmental Services, LLC certifies that the test results indicated as NELAP (National Environmental Laboratory Accreditation Program) accredited (Yes for NELAP) meet all requirements of NELAP and Kansas (KDHE) unless otherwise explained or justified as to the the exact nature of the deviations.
KS ELAP / NELAP Accreditation # E-10177 Indiana SDWA C-49-01

Christine Sarkan

Approved by: CHRISTINE SARKAN 06-NOV-12

RECEIVED
NOV 14 2012
DIVISION OF ENVIRONMENTAL COMPLIANCE

Metropolitan St. Louis Sewer District

Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

November 13, 2012

David Vasbinder
Environmental Manager
BRIDGETON LANDFILL LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044

RE: WASTEWATER DISCHARGE PERMIT NO. 0511559802 - 2
For premise at: 13570 St. Charles Rock Road, Bridgeton, MO 63044

Dear Mr. Vasbinder:

As Bryan Sehie was notified in a voicemail on November 7, MSD personnel recently collected and analyzed samples of wastewater discharged to the MSD system from the premise above. Unfortunately, we identified the following exceedances of discharge limitations:

Certain volatile chemical compounds were found at elevated levels as indicated below:

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	GAS/VAPOR TOXIC SCREENING LEVEL	VALUE FOUND
10/23/12	**0845**	**007**	**Grab**	**Benzene**	**0.14 mg/L**	**0.217 mg/L**
10/23/12	0845	007	Grab	1,4 Dichlorobenzene	3.55 mg/L	0.0966mg/L
10/23/12	0845	007	Grab	Chlorobenzene	2.31 mg/L	0.0293 mg/L
10/23/12	0845	007	Grab	Ethylbenzene	1.59 mg/L	0.0244 mg/L
10/23/12	0845	007	Grab	Toluene	1.36 mg/L	0.04913 mg/L
10/23/12	1035	007	Grab	Xylenes	1.74 mg/L	0.0783 mg/L
10/23/12	1035	007	Grab	2-Butanone	249 mg/L	21.4 mg/L
10/22/12	**1035**	**007**	**Grab**	**Benzene**	**0.14 mg/L**	**0.275 mg/L**
10/22/12	1035	007	Grab	1,4 Dichlorobenzene	3.55 mg/L	0.136 mg/L
10/22/12	1035	007	Grab	Chlorobenzene	2.31 mg/L	0.021 mg/L
10/22/12	1035	007	Grab	Ethylbenzene	1.59 mg/L	0.0328 mg/L
10/22/12	1035	007	Grab	Toluene	1.36 mg/L	0.06056 mg/L
10/22/12	1035	007	Grab	Xylenes	1.74 mg/L	0.104 mg/L
10/22/12	1035	007	Grab	2-Butanone	249 mg/L	14.5 mg/L

mg/L = milligrams per liter SP007 - 14" pipe into Westlink Pump Station Wetwell, on S side

Any other toxic organics which are or may be present in your discharge returned analytical values less than the minimum reporting level.

Wastewater discharges are prohibited under Ordinance 12559, Article V, Section One.A.8 if they cause or contribute to emissions of toxic gases, vapors, or fumes into the sewer atmosphere at levels in excess of applicable exposure levels. The presence of volatile chemical compounds at concentrations above the screening levels can result in the generation of toxic gases or vapors in the sewer atmosphere. Such conditions pose a serious threat to the health and safety of MSD personnel and to other users of the sewer system. If several compounds are present at elevated levels, the potential for the generation of toxic gases or vapors increases due to possible additive and/or synergistic effects.

We recognize that you already are taking corrective actions under the Administrative Compliance Order issued on October 26, 2012. Please keep MSD informed of your progress, as required by the order.

Please refer to the enclosure for additional information on:

a. Potential enforcement actions should noncompliance continue
b. Percentages applicable to Significant Noncompliance, when planning for additional sampling

Thank you for helping us to comply with state and federal regulations. If you have any questions, please contact me at 314.436.8719.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

TB

Tom Boehm
Environmental Engineering Associate

Enclosure: SP map, SNC enclosure,

Doug Mendoza 10073813690

From:	Doug Mendoza pb
Sent:	Tuesday, November 13, 2012 9:45 AM
To:	Rob G Daly
Cc:	Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject:	RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Sorry to spam you all, but the fume toxicity alert level for MEK/2-butanone is actually 249 mg/L (based on EPA data), not 289 mg/L.

Doug

From: Doug Mendoza
Sent: Tuesday, November 13, 2012 8:43 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Rob,

Last bit of info. for the samples we took at Bridgeton Landfill on 10/22 and 10/23. We sampled for volatile organic chemicals, including methyl ethyl ketone (MEK, aka 2-butanone). All the volatile organics that we analyze for were non-detect, except for:

MEK = 21.4 mg/L on 10/22/12, and
MEK = 14.5 mg/L on 10/23/12.

However, the fume toxicity alert level is 289 mg/L for MEK. I suspect that it is probably contributing to the odor (along with phenols, and whatever myriad other stuff is there that we cannot analyze for), but doesn't appear to be at unsafe levels.

Note that MEK is not a normal chemical that we analyze. I made a special request for it. I somewhat expected this, since MEK also showed up in the landfill's results that they took back in May.

As I said before and below, if anyone else – specifically Risk Management – sees info. in the data that raises flags, please let us all know. We are not trained in all the health & safety aspects.

---Doug

From: Doug Mendoza
Sent: Tuesday, November 06, 2012 9:26 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Rob,

Doug Mendoza

10073800001

From: Doug Mendoza
Sent: Tuesday, November 13, 2012 8:43 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Rob,

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MEK = 14.5 mg/L on 10/23/12.

However, the fume toxicity alert level is 289 mg/L for MEK. I suspect that it is probably contributing to the odor (along with phenols, and whatever myriad other stuff is there that we cannot analyze for), but doesn't appear to be at unsafe levels.

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As I said before and below, if anyone else – specifically Risk Management – sees info. in the data that raises flags, please let us all know. We are not trained in all the health & safety aspects.

---Doug

From: Doug Mendoza
Sent: Tuesday, November 06, 2012 9:26 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Rob,

We have received the results of the sampling conducted at the Westlake PS/Bridgeton Landfill discharge on October 4, 5, 11, and 12. Results for the various organic chemicals we analyze were all at minimal or below detection levels, which is good. In any case, we don't see any results with them that should be of concern.

However, as I indicated in my earlier email, we did see pretty high levels of total phenols. The results were

10/04/12 Total Phenols = 38.14 mg/L
10/05/12 Total Phenols = 77.85 mg/L
10/10/12 Total Phenols = 60.65 mg/L
10/11/12 Total Phenols = 53.93 mg/L

What I wrote below still applies. The primary concern for this level of total phenols will be the pretty strong smell.

Doug Mendoza 1003803006

From: Roger Rowan
Sent: Friday, November 09, 2012 9:09 AM
To: Doug Mendoza
Subject: RE: Special samples at Bridgeton Landfill, to check for VOLATILE organics

Doug, 2-Butone was analyzed. It was not in the list of compounds so I put the value in the comment section in the LIMS.

Roger

From: Doug Mendoza
Sent: Thursday, November 08, 2012 5:11 PM
To: Kathleen Wahoff; Roger Rowan
Cc: Brian G. Gibson; Christopher J. Bulmahn; Tom Boehm
Subject: FW: Special samples at Bridgeton Landfill, to check for VOLATILE organics

Kathy & Roger,

Please see below. Can you tell me why Methyl Ethyl Ketone was not analyzed? (See attached COA's)

It was specifically added (T433000) on the list of pollutants requested for analysis.

---Doug

From: Brian G. Gibson
Sent: Tuesday, October 23, 2012 12:47 PM
To: Doug Mendoza
Subject: RE: Special samples at Bridgeton Landfill, to check for VOLATILE organics

SMN: 95089 (10/22/12)
95084 (10/23/12)

From: Doug Mendoza
Sent: Friday, October 19, 2012 8:33 AM
To: Brian G. Gibson
Cc: Kathleen Wahoff; Roger Rowan; Tom Boehm; Christopher J. Bulmahn
Subject: FW: Special samples at Bridgeton Landfill, to check for VOLATILE organics

Brian,

I don't know why, but I didn't ask for volatile organics & MEK to be sampled when you did the other sampling at Bridgeton Landfill!

Please set up special sampling:

- **BRIDGETON LANDFILL LLC [1003803000], SP007 (14" pipe into Westlink Pump Station Wetwell, on S side).**
- **Need 2 samples taken, on 2 separate days, ASAP.**
- **Only need these pollutants analyzed**
  - **Pollutant Group " Volatile Orgs-not incl Acro/Acryl & 2-chloroethyl" T996000**
  - **Methyl Ethyl Ketone (2-butanone) T433000**

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PIM- Add/Edit Samples

Doug Mendoza - DEC

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- Sample Disposition
- SOPs and Documents
- Send Alert Message
- Change Password
- Treatment Plant Scheduling
- Sampling related items and lists

Sample Num:	1295089IMV038557	Client Loc/Sample Point:	MSDPIMS Location / MSDPIMS Smpl Point
SMN:	95089	Project Type:	IM
Status:	Complete	Priority:	Standard
Sample Type:	No Selection	Lab Due Date:	
Billable:	☐	COC Number:	493-102212
Received:	☑	Received Date:	10/22/2012 13 : 05
Received By:	Gibson, Brian	Adhoc:	☐
Sample Hold:	☐	Created Date / Time:	10/19/2012 10:25:24 AM
Created By:	Administrator, System	Edited Date / Time:	10/26/2012 11:27:56 AM
Edited By:	Rowan, Roger	Complete Date:	11/6/2012 9:26:05 AM
Cancel Code:	No Selection	Container Name:	VO
Requested By:		Reason:	No Selection
Permitted:	☐		

Comments

Hazardous Waste Comment:	
Description:	Auto Import
Final Rpt. Comment:	
Sample Disposal Comments:	

Comment:

2- butanone 21400ppb

Done | Local intranet | 100%

start | Inbox - Mailbox - Dou... | PIMS - Pretreatment ... | Industry Files - Laser... | LABLynx ELab, Copyr... | RE: Special samples a... | 12:22 PM

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Sample Num:	1295084IMV038558	Client Loc/Sample Point:	MSDPIMS Location / MSDPIMS Smpl Point
SMN:	95084	Project Type:	IM
Status:	Complete	Priority :	Standard
Sample Type:	No Selection	Lab Due Date:	
Billable:	☐	COC Number:	493-102312
Received:	☑	Received Date:	10/23/2012 10 : 45
Received By:	Gibson, Brian	Adhoc:	☐
Sample Hold:	☐	Created Date / Time:	10/19/2012 10:25:24 AM
Created By:	Administrator, System	Edited Date / Time:	10/26/2012 11:29:14 AM
Edited By:	Rowan, Roger	Complete Date:	11/6/2012 9:26:05 AM
Cancel Code:	No Selection	Container Name:	V0
Requested By:		Reason:	No Selection
Permitted:	☐		

Comments

Hazardous Waste Comment:

Description: Auto Import

Final Rpt. Comment:

Sample Disposal Comments:

Comment:

2-butanone 14500ppb

Done — Local intranet — 100%

start — Inbox - Mailbox - Dou... — PIMS - Pretreatment... — Industry Files - Laser... — LABLynx ELab, Copyr... — RE: Special samples a... — 12:23 PM

Doug Mendoza

Bridgeton Landfill
1003803000

From: Doug Mendoza
Sent: Tuesday, November 06, 2012 9:26 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose; Kathleen Wahoff
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)
Attachments: Bridgeton Landfill results.xls

Rob,

We have received the results of the sampling conducted at the Westlake PS/Bridgeton Landfill discharge on October 4, 5, 11, and 12. Results for the various organic chemicals we analyze were all at minimal or below detection levels, which is good. In any case, we don't see any results with them that should be of concern.

However, as I indicated in my earlier email, we did see pretty high levels of total phenols. The results were

10/04/12 Total Phenols = 38.14 mg/L
10/05/12 Total Phenols = 77.85 mg/L
10/10/12 Total Phenols = 60.65 mg/L
10/11/12 Total Phenols = 53.93 mg/L

What I wrote below still applies. The primary concern for this level of total phenols will be the pretty strong smell.

I also noticed that the ammonia was 700 mg/L on 10/04/12, the only one of the four samples we tested for ammonia. While that may seem pretty high, it is not out of line with historical readings from the landfill. However, coupled with the total phenols and any other odorous compounds, it could just compound the impact.

For some reason, I forgot to have the above samples analyzed for methyl ethyl ketone (2-butanone). However, I had samples collected for that on 10/22/12 and 10/23/12. I will let you know how the results turn out.

I am not an expert in health or toxicity. And there are many potential chemicals that we do not test for. The raw data is attached, if anyone wants to review it. If any of the other recipients have further insight into the pollutants or into other specifics we should have tested, please let us know.

You may have read or heard some of the recent media reports about the smell at Bridgeton Landfill. A number of agencies have looked into it, but none have taken any action.

---Doug

From: Doug Mendoza
Sent: Thursday, October 18, 2012 10:46 AM
To: Rob G Daly
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright; John Lodderhose
Subject: RE: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Rob,

Sampling was conducted (and completed) on 10/4/12, 10/5/12, 10/11/12, and 10/12/12.

It generally takes 2 weeks for our lab to perform the requested organic analyses. I would expect to have results at the end of next week, but possibly not until early the week of 10/29/12.

Preliminary results for the 10/4 and 10/5 results indicate high levels of Total Phenols. I had indicated earlier that our limits on this are based on water quality criteria, not due to health concerns. Although the stuff is going to smell and could be nauseating. Individual organics all appear to be low (at least those that we can test for). I'll give more details when we get all our results, and can then discuss in more detail what it all means.

---Doug

From: Rob G Daly
Sent: Wednesday, October 17, 2012 9:34 AM
To: Doug Mendoza
Cc: Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm; Brian G. Gibson; Ryan Sabourin; Mark Bright
Subject: Westlakes PS- Sampling (Bridgeton Landfill-Organics)

Doug

Just wondering if I could get a status update on testing results? I know if you had them we would have heard form you- but just wanted to see if I could get a date on my calendar as to when you might expect the results- which I think would like to then review at your place with Mark Bright and Ryan if possible.

Any info appreciated. Many thanks.

Rob Daly, EIT
Division Manager- Pump Stations
Department of Operations
Metropolitan St Louis Sewer District
1025 Grand Glaize Parkway
Valley Park, MO 63088-1952
(636) 861-6706 (Office)

rdaly@stlmsd.com

From: Doug Mendoza
Sent: Monday, October 01, 2012 11:16 AM
To: Brian G. Gibson
Cc: Rob G Daly; Nora C. Estopare; Christopher J. Bulmahn; Tom Boehm
Subject: Special samples at Bridgeton Landfill, to check for organics

Brian,

Please set up special sampling:

- **BRIDGETON LANDFILL LLC [1003803000], SP007 (14" pipe into Westlink Pump Station Wetwell, on S side).**
- **Need 4 samples taken, 2 this week, 2 next week**
- **Only need these pollutants analyzed**
    - **Pollutant Group "Semi-Volatile Organics – Acids" T995000**
    - **Pollutant Group "Semi-Volatile Organics – Base/Neutrals" T994000**
    - **Single Pollutant "Total Phenols" T257000**
- **You may want to collect one of these samples as part of your normal quarterly monitoring.**

Rob Daly informed us that MSD workers still complain of nausea, etc. even after ventilation occurs, when working around the pump station that Bridgeton Landfill discharges into. The four gas meters are showing that those gas levels are safe, but there are of course myriad other pollutants that can affect people.. While there is no way to test for every conceivable pollutant that could be discharged, we can focus on likely potential culprits.

I looked at Bridgeton Landfill's discharges from earlier this year that showed possible fume toxicity concerns. The last problem showed the following:

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	GAS/VAPOR TOXIC SCREENING LEVEL	VALUE FOUND
05-15-12	1000	008	Grab	Benzene	0.14 mg/L	0.770 mg/L
05-15-12	1000	008	24-hr comp	Phenol	1024 mg/L	7.700 mg/L
05-15-12	1000	008	24-hr comp	P-Cresol	NA	3.100 mg/L
05-15-12	1000	008	Grab	Chlorobenzene	2.31 mg/L	0.072 mg/L
05-15-12	1000	008	Grab	1,2-Dichloroethane	1.05 mg/L	0.018 mg/L
05-15-12	1000	008	Grab	Ethyl Benzene	1.59 mg/L	0.130 mg/L
05-15-12	1000	008	Grab	Toluene	1.36 mg/L	0.170 mg/L

We also included that "2-Butanone was present in elevated levels but is not part of the constituents that make up the TTO sample."

FYI, 2-Butanone is more commonly known at Methyl Ethyl Ketone (MEK), and was present at 20 mg/L.

Furthermore, I did some research, and developed Gas/Vapor Toxic Screening Levels:

- Methyl Ethyl Ketone: 289 mg/L. So the sample was well below this – which makes sense, since people use it all the time.
- P-Cresol (4-methylphenol): 309 mg/L. Again, the sample was well below this.

With the ventilation that is occurring, these toxic organics shouldn't be problems either. However, we need to see if they are still being discharged.

Rob – One other item of note, more for your info. than anything. MSD normally only tests for Toxic Organics once/year, due to costs. However, for landfills and hospitals we test to Total Phenols every time we sample. These are commonly found in their discharges. The discharge limit is 21 mg/L, and is based on water quality at treatment plants, not worker safety concerns. MSD's 7/10/12 sample showed total phenols from Bridgeton Landfill of 19.976 mg/L, and MSD's 5/13/12 sample showed 19.63 mg/L. Prior to that, total phenols was running 2-5 mg/L. I mention this because phenols are pretty smelly. Think of Campho-Phenique and cleaners with phenols in them. But they are not especially toxic. Campho-Phenique is actually used on sores, etc. It's just not supposed to be taken internally.

--Doug

DATE	SP	POLLUTANT		RESULT	UNIT
10/11/12	007	pH		6.16	SU
10/11/12	007	Temperature		27.3	Deg C
10/11/12	007	Total Phenols		53.93	mg/L
10/11/12	007	1,2,4-Trichlorobenzene	<	10	ug/L
10/11/12	007	1,2-Dichlorobenzene	<	10	ug/L
10/11/12	007	1,2-Diphenylhydrazine	<	10	ug/L
10/11/12	007	1,3-Dichlorobenzene	<	10	ug/L
10/11/12	007	1,4-Dichlorobenzene	<	10	ug/L
10/11/12	007	2,4,6-Trichlorophenol	<	100	ug/L
10/11/12	007	2,4-Dichlorophenol	<	100	ug/L
10/11/12	007	2,4-Dimethylphenol	<	100	ug/L
10/11/12	007	2,4-Dinitrophenol	<	2000	ug/L
10/11/12	007	2,4-Dinitrotoluene	<	10	ug/L
10/11/12	007	2,6-Dinitrotoluene	<	10	ug/L
10/11/12	007	2-Chloronaphthalene	<	10	ug/L
10/11/12	007	2-Chlorophenol	<	100	ug/L
10/11/12	007	2-Nitrophenol	<	100	ug/L
10/11/12	007	3,3-Dichlorobenzidine	<	10	ug/L
10/11/12	007	4,6-Dinitro-2-Methylphenol	<	780	ug/L
10/11/12	007	4-Bromophenyl phenyl ether	<	10	ug/L
10/11/12	007	4-Chloro-3-Methylphenol	<	100	ug/L
10/11/12	007	4-Chlorophenyl phenyl ether	<	10	ug/L
10/11/12	007	4-Nitrophenol	<	250	ug/L
10/11/12	007	Acenaphthene		12	ug/L
10/11/12	007	Acenaphthylene	<	10	ug/L
10/11/12	007	Anthracene		44.1	ug/L
10/11/12	007	Benzidine	<	80	ug/L
10/11/12	007	Benzo (A) Anthracene	<	10	ug/L
10/11/12	007	Benzo (A) Pyrene	<	10	ug/L
10/11/12	007	Benzo (B) Fluoranthene	<	10	ug/L
10/11/12	007	Benzo (G,H,I) Perylene	<	10	ug/L
10/11/12	007	Benzo (K) Fluoranthene	<	10	ug/L
10/11/12	007	Bis (2-Chloroethoxy) Methane	<	10	ug/L
10/11/12	007	Bis (2-Chloroethyl) Ether	<	10	ug/L
10/11/12	007	Bis (2-Chloroisopropyl) Ether	<	10	ug/L
10/11/12	007	Bis (2-EthylHexyl) Phthalate		16.2	ug/L
10/11/12	007	Butylbenzyl Phthalate	<	10	ug/L
10/11/12	007	Chrysene	<	10	ug/L
10/11/12	007	Dibenzo (A,H) Anthracene	<	10	ug/L
10/11/12	007	Diethyl Phthalate	<	10	ug/L
10/11/12	007	Dimethyl Phthalate	<	10	ug/L
10/11/12	007	Di-n-butyl Phthalate		14.6	ug/L
10/11/12	007	Di-n-octyl Phthalate	<	10	ug/L
10/11/12	007	Fluoranthene	<	10	ug/L
10/11/12	007	Fluorene		13.2	ug/L
10/11/12	007	Hexachlorobenzene	<	10	ug/L
10/11/12	007	Hexachlorobutadiene	<	2	ug/L
10/11/12	007	Hexachlorocyclopentadiene	<	2	ug/L
10/11/12	007	Hexachloroethane	<	10	ug/L
10/11/12	007	Indeno (1,2,3-cd) pyrene	<	10	ug/L
10/11/12	007	Isophorone	<	10	ug/L

10/11/12	007	Naphthalene		61.3 ug/L
10/11/12	007	Nitrobenzene	<	10 ug/L
10/11/12	007	N-Nitrosodimethylamine	<	10 ug/L
10/11/12	007	N-Nitrosodi-n-Propylamine	<	10 ug/L
10/11/12	007	N-Nitrosodiphenylamine	<	10 ug/L
10/11/12	007	Pentachlorophenol	<	250 ug/L
10/11/12	007	Phenanthrene		26.4 ug/L
10/11/12	007	Phenol		10522 ug/L
10/11/12	007	Pyrene	<	10 ug/L
10/10/12	007	pH		6.23 SU
10/10/12	007	Temperature		21.3 Deg C
10/10/12	007	Total Phenols		60.65 mg/L
10/10/12	007	1,2,4-Trichlorobenzene	<	10 ug/L
10/10/12	007	1,2-Dichlorobenzene	<	10 ug/L
10/10/12	007	1,2-Diphenylhydrazine	<	10 ug/L
10/10/12	007	1,3-Dichlorobenzene	<	10 ug/L
10/10/12	007	1,4-Dichlorobenzene		49.2 ug/L
10/10/12	007	2,4,6-Trichlorophenol	<	100 ug/L
10/10/12	007	2,4-Dichlorophenol	<	100 ug/L
10/10/12	007	2,4-Dimethylphenol	<	100 ug/L
10/10/12	007	2,4-Dinitrophenol	<	2000 ug/L
10/10/12	007	2,4-Dinitrotoluene	<	10 ug/L
10/10/12	007	2,6-Dinitrotoluene	<	10 ug/L
10/10/12	007	2-Chloronaphthalene	<	10 ug/L
10/10/12	007	2-Chlorophenol	<	100 ug/L
10/10/12	007	2-Nitrophenol	<	100 ug/L
10/10/12	007	3,3-Dichlorobenzidine	<	10 ug/L
10/10/12	007	4,6-Dinitro-2-Methylphenol	<	780 ug/L
10/10/12	007	4-Bromophenyl phenyl ether	<	10 ug/L
10/10/12	007	4-Chloro-3-Methylphenol	<	100 ug/L
10/10/12	007	4-Chlorophenyl phenyl ether	<	10 ug/L
10/10/12	007	4-Nitrophenol	<	250 ug/L
10/10/12	007	Acenaphthene		18.6 ug/L
10/10/12	007	Acenaphthylene	<	10 ug/L
10/10/12	007	Anthracene	<	10 ug/L
10/10/12	007	Benzidine	<	80 ug/L
10/10/12	007	Benzo (A) Anthracene	<	10 ug/L
10/10/12	007	Benzo (A) Pyrene	<	10 ug/L
10/10/12	007	Benzo (B) Fluoranthene	<	10 ug/L
10/10/12	007	Benzo (G,H,I) Perylene	<	10 ug/L
10/10/12	007	Benzo (K) Fluoranthene	<	10 ug/L
10/10/12	007	Bis (2-Chloroethoxy) Methane	<	10 ug/L
10/10/12	007	Bis (2-Chloroethyl) Ether	<	10 ug/L
10/10/12	007	Bis (2-Chloroisopropyl) Ether	<	10 ug/L
10/10/12	007	Bis (2-EthylHexyl) Phthalate		16.1 ug/L
10/10/12	007	Butylbenzyl Phthalate	<	10 ug/L
10/10/12	007	Chrysene	<	10 ug/L
10/10/12	007	Dibenzo (A,H) Anthracene	<	10 ug/L
10/10/12	007	Diethyl Phthalate	<	10 ug/L
10/10/12	007	Dimethyl Phthalate	<	10 ug/L
10/10/12	007	Di-n-butyl Phthalate		16.6 ug/L
10/10/12	007	Di-n-octyl Phthalate	<	10 ug/L

10/10/12	007	Fluoranthene	<	10 ug/L
10/10/12	007	Fluorene	<	10 ug/L
10/10/12	007	Hexachlorobenzene	<	10 ug/L
10/10/12	007	Hexachlorobutadiene	<	2 ug/L
10/10/12	007	Hexachlorocyclopentadiene	<	2 ug/L
10/10/12	007	Hexachloroethane	<	10 ug/L
10/10/12	007	Indeno (1,2,3-cd) pyrene	<	10 ug/L
10/10/12	007	Isophorone	<	10 ug/L
10/10/12	007	Naphthalene		71.4 ug/L
10/10/12	007	Nitrobenzene	<	10 ug/L
10/10/12	007	N-Nitrosodimethylamine	<	10 ug/L
10/10/12	007	N-Nitrosodi-n-Propylamine	<	10 ug/L
10/10/12	007	N-Nitrosodiphenylamine	<	10 ug/L
10/10/12	007	Pentachlorophenol	<	250 ug/L
10/10/12	007	Phenanthrene		35.1 ug/L
10/10/12	007	Phenol		8163.4 ug/L
10/10/12	007	Pyrene	<	10 ug/L
10/05/12	007	1,2,4-Trichlorobenzene	<	50 ug/L
10/05/12	007	1,2-Dichlorobenzene	<	50 ug/L
10/05/12	007	1,2-Diphenylhydrazine	<	50 ug/L
10/05/12	007	1,3-Dichlorobenzene	<	50 ug/L
10/05/12	007	1,4-Dichlorobenzene	<	50 ug/L
10/05/12	007	2,4,6-Trichlorophenol	<	50 ug/L
10/05/12	007	2,4-Dichlorophenol	<	50 ug/L
10/05/12	007	2,4-Dimethylphenol	<	50 ug/L
10/05/12	007	2,4-Dinitrophenol	<	1000 ug/L
10/05/12	007	2,4-Dinitrotoluene	<	50 ug/L
10/05/12	007	2,6-Dinitrotoluene	<	50 ug/L
10/05/12	007	2-Chloronaphthalene	<	50 ug/L
10/05/12	007	2-Chlorophenol	<	50 ug/L
10/05/12	007	2-Nitrophenol	<	50 ug/L
10/05/12	007	3,3-Dichlorobenzidine	<	50 ug/L
10/05/12	007	4,6-Dinitro-2-Methylphenol	<	390 ug/L
10/05/12	007	4-Bromophenyl phenyl ether	<	50 ug/L
10/05/12	007	4-Chloro-3-Methylphenol	<	50 ug/L
10/05/12	007	4-Chlorophenyl phenyl ether	<	50 ug/L
10/05/12	007	4-Nitrophenol	<	125 ug/L
10/05/12	007	Acenaphthene	<	50 ug/L
10/05/12	007	Acenaphthylene	<	50 ug/L
10/05/12	007	Anthracene	<	50 ug/L
10/05/12	007	Benzidine	<	400 ug/L
10/05/12	007	Benzo (A) Anthracene	<	50 ug/L
10/05/12	007	Benzo (A) Pyrene	<	50 ug/L
10/05/12	007	Benzo (B) Fluoranthene	<	50 ug/L
10/05/12	007	Benzo (G,H,I) Perylene	<	50 ug/L
10/05/12	007	Benzo (K) Fluoranthene	<	50 ug/L
10/05/12	007	Bis (2-Chloroethoxy) Methane	<	50 ug/L
10/05/12	007	Bis (2-Chloroethyl) Ether	<	50 ug/L
10/05/12	007	Bis (2-Chloroisopropyl) Ether	<	50 ug/L
10/05/12	007	Bis (2-EthylHexyl) Phthalate	<	50 ug/L
10/05/12	007	Butylbenzyl Phthalate	<	50 ug/L
10/05/12	007	Chrysene	<	50 ug/L

10/05/12	007	Dibenzo (A,H) Anthracene	<	50 ug/L
10/05/12	007	Diethyl Phthalate	<	50 ug/L
10/05/12	007	Dimethyl Phthalate	<	50 ug/L
10/05/12	007	Di-n-butyl Phthalate	<	50 ug/L
10/05/12	007	Di-n-octyl Phthalate	<	50 ug/L
10/05/12	007	Fluoranthene	<	50 ug/L
10/05/12	007	Fluorene	<	50 ug/L
10/05/12	007	Hexachlorobenzene	<	50 ug/L
10/05/12	007	Hexachlorobutadiene	<	10 ug/L
10/05/12	007	Hexachlorocyclopentadiene	<	10 ug/L
10/05/12	007	Hexachloroethane	<	50 ug/L
10/05/12	007	Indeno (1,2,3-cd) pyrene	<	50 ug/L
10/05/12	007	Isophorone	<	50 ug/L
10/05/12	007	Naphthalene	<	50 ug/L
10/05/12	007	Nitrobenzene	<	50 ug/L
10/05/12	007	N-Nitrosodimethylamine	<	50 ug/L
10/05/12	007	N-Nitrosodi-n-Propylamine	<	50 ug/L
10/05/12	007	N-Nitrosodiphenylamine	<	50 ug/L
10/05/12	007	Pentachlorophenol	<	125 ug/L
10/05/12	007	Phenanthrene	<	50 ug/L
10/05/12	007	Phenol	<	50 ug/L
10/05/12	007	Pyrene	<	50 ug/L
10/05/12	007	pH		6.38 SU
10/05/12	007	Temperature		15.7 Deg C
10/05/12	007	Total Phenols		77.85 mg/L
10/04/12	007	1,2,4-Trichlorobenzene	<	100 ug/L
10/04/12	007	1,2-Dichlorobenzene	<	100 ug/L
10/04/12	007	1,2-Diphenylhydrazine	<	100 ug/L
10/04/12	007	1,3-Dichlorobenzene	<	100 ug/L
10/04/12	007	1,4-Dichlorobenzene	<	100 ug/L
10/04/12	007	2,4,6-Trichlorophenol	<	100 ug/L
10/04/12	007	2,4,6-Trichlorophenol	<	100 ug/L
10/04/12	007	2,4-Dichlorophenol	<	100 ug/L
10/04/12	007	2,4-Dichlorophenol	<	100 ug/L
10/04/12	007	2,4-Dimethylphenol	<	100 ug/L
10/04/12	007	2,4-Dimethylphenol	<	100 ug/L
10/04/12	007	2,4-Dinitrophenol	<	2000 ug/L
10/04/12	007	2,4-Dinitrophenol	<	2000 ug/L
10/04/12	007	2,4-Dinitrotoluene	<	100 ug/L
10/04/12	007	2,6-Dinitrotoluene	<	100 ug/L
10/04/12	007	2-Chloronaphthalene	<	100 ug/L
10/04/12	007	2-Chlorophenol	<	100 ug/L
10/04/12	007	2-Chlorophenol	<	100 ug/L
10/04/12	007	2-Nitrophenol	<	100 ug/L
10/04/12	007	2-Nitrophenol	<	100 ug/L
10/04/12	007	3,3-Dichlorobenzidine	<	100 ug/L
10/04/12	007	4,6-Dinitro-2-Methylphenol	<	780 ug/L
10/04/12	007	4,6-Dinitro-2-Methylphenol	<	780 ug/L
10/04/12	007	4-Bromophenyl phenyl ether	<	100 ug/L
10/04/12	007	4-Chloro-3-Methylphenol	<	100 ug/L
10/04/12	007	4-Chloro-3-Methylphenol	<	100 ug/L
10/04/12	007	4-Chlorophenyl phenyl ether	<	100 ug/L

10/04/12	007	4-Nitrophenol	<	250 ug/L
10/04/12	007	4-Nitrophenol	<	250 ug/L
10/04/12	007	Acenaphthene	<	100 ug/L
10/04/12	007	Acenaphthylene	<	100 ug/L
10/04/12	007	Ammonia (as N)		700 mg/L
10/04/12	007	Anthracene	<	100 ug/L
10/04/12	007	Antimony (Total)	<	0.024 mg/L
10/04/12	007	Arsenic (Total)	<	0.008 mg/L
10/04/12	007	Benzidine	<	800 ug/L
10/04/12	007	Benzo (A) Anthracene	<	100 ug/L
10/04/12	007	Benzo (A) Pyrene	<	100 ug/L
10/04/12	007	Benzo (B) Fluoranthene	<	100 ug/L
10/04/12	007	Benzo (G,H,I) Perylene	<	100 ug/L
10/04/12	007	Benzo (K) Fluoranthene	<	100 ug/L
10/04/12	007	Beryllium (Total)	<	0.0006 mg/L
10/04/12	007	Biochemical Oxygen Demand (5 Day)		19000 mg/L
10/04/12	007	Bis (2-Chloroethoxy) Methane	<	100 ug/L
10/04/12	007	Bis (2-Chloroethyl) Ether	<	100 ug/L
10/04/12	007	Bis (2-Chloroisopropyl) Ether	<	100 ug/L
10/04/12	007	Bis (2-EthylHexyl) Phthalate	<	100 ug/L
10/04/12	007	Butylbenzyl Phthalate	<	100 ug/L
10/04/12	007	Cadmium (Total)	<	0.009 mg/L
10/04/12	007	Chemical Oxygen Demand		32800 mg/L
10/04/12	007	Chromium (Total)	<	0.01 mg/L
10/04/12	007	Chrysene	<	100 ug/L
10/04/12	007	Copper (Total)	<	0.009 mg/L
10/04/12	007	Cyanide Amenable to Chlorination	<	0.02 mg/L
10/04/12	007	Dibenzo (A,H) Anthracene	<	100 ug/L
10/04/12	007	Diethyl Phthalate	<	100 ug/L
10/04/12	007	Dimethyl Phthalate	<	100 ug/L
10/04/12	007	Di-n-butyl Phthalate	<	100 ug/L
10/04/12	007	Di-n-octyl Phthalate	<	100 ug/L
10/04/12	007	Fluoranthene	<	100 ug/L
10/04/12	007	Fluorene	<	100 ug/L
10/04/12	007	Hexachlorobenzene	<	100 ug/L
10/04/12	007	Hexachlorobutadiene	<	20 ug/L
10/04/12	007	Hexachlorocyclopentadiene	<	20 ug/L
10/04/12	007	Hexachloroethane	<	100 ug/L
10/04/12	007	Indeno (1,2,3-cd) pyrene	<	100 ug/L
10/04/12	007	Isophorone	<	100 ug/L
10/04/12	007	Lead (Total)	<	0.02 mg/L
10/04/12	007	Mercury (Total)	<	0.0003 mg/L
10/04/12	007	Naphthalene	<	100 ug/L
10/04/12	007	Nickel (Total)	<	0.04 mg/L
10/04/12	007	Nitrobenzene	<	100 ug/L
10/04/12	007	N-Nitrosodimethylamine	<	100 ug/L
10/04/12	007	N-Nitrosodi-n-Propylamine	<	100 ug/L
10/04/12	007	N-Nitrosodiphenylamine	<	100 ug/L
10/04/12	007	Oil and Grease (Total)		19.3 mg/L
10/04/12	007	Pentachlorophenol	<	250 ug/L
10/04/12	007	Pentachlorophenol	<	250 ug/L
10/04/12	007	pH		6.47 SU

10/04/12	007	Phenanthrene	<	100	ug/L
10/04/12	007	Phenol	<	100	ug/L
10/04/12	007	Phenol	<	100	ug/L
10/04/12	007	Pyrene	<	100	ug/L
10/04/12	007	Selenium (Total)	<	0.006	mg/L
10/04/12	007	Silver (Total)	<	0.006	mg/L
10/04/12	007	Temperature		27.5	Deg C
10/04/12	007	Thallium (Total)	<	0.0018	mg/L
10/04/12	007	Total Phenols		38.14	mg/L
10/04/12	007	Total Suspended Solids		616	mg/L
10/04/12	007	Zinc (Total)		2.94	mg/L

√ BR
CB
4/13

Mr. Chris Bulmahn
Associate Engineer
Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913

November 1, 2012

Dear Mr. Bulmahn:

Response to Notice of Violation,
Bridgeton Landfill, Bridgeton, MO, MSD Permit #: 0511559802-2
10038030 00

The Bridgeton Landfill, LLC. is submitting this letter of response to the Notice of Violation (NOV) that was issued to the Bridgeton Landfill on October 17, 2012 by the Metropolitan St. Louis Sewer District (MSD). The NOV states that the Bridgeton Landfill is in violation of the permitted wastewater discharge limitation for Zinc. MSD Wastewater Discharge Permit No. 0511559802-2 specifies that the wastewater discharged from the Bridgeton Landfill to MSD may contain a Total Zinc concentration of no more than 3.0 mg/L. The following table contains results reported from the Third Quarter 2012 leachate sample collection, conducted as a 24-hour composite on the dates of September 18-19, 2012, in comparison to permitted limitations, according to the NOV:

Outfall	Parameter	Result	Permitted Daily Average Limitation
Outfall 007	Total Zinc	3.5 mg/L	3.0 mg/L

Zinc concentrations have been historically low in the leachate discharged from the Bridgeton Landfill according to past sampling results. A series of three resamples have been conducted since the Bridgeton Landfill became aware of the exceedance to prove the facility's return to compliance with permitted discharge limitations. Resamples were collected, as 24-hour composites, on the dates of October 15-16, October 29-30, and October 31 – November 1, 2012, and shipped to Heritage Environmental Services for analysis of Total Zinc. All analytical results will be submitted to MSD once they become available.

The Bridgeton Landfill will continue to inspect and maintain all leachate collection and treatment systems in effort to reduce, eliminate, and prevent any permitted discharge exceedances. Though Zinc did exceed the permitted discharge limitation during the Third Quarter 2012, the Bridgeton Landfill believes this sample to be non-representative of overall leachate quality based on historical data. The Bridgeton Landfill is in the process of researching methodology for Zinc reduction in wastewater should this constituent present a repeated issue in the leachate discharge.

If a representative from the MSD – Division of Environmental Compliance would like to observe the leachate collection and treatment systems at the Bridgeton Landfill site personnel would be available to help coordinate such a visit..

Please contact David Vasbinder, Environmental Manager at 314-744-8166, or myself at 314-744-81[illegible] if you have any questions or comments.

RECEIVED
NOV 05 2012
DIVISION OF
ENVIRONMENTAL COMPLIANCE

13570 St. Charles Rock Road
Bridgeton, MO 63044
Telephone (314) [illegible]

Sincerely,

BRIDGETON LANDFILL, LLC.

Bryan K. Sehie
Environmental Specialist

RECEIVED
NOV 05 2012
DIVISION OF
ENVIRONMENTAL COMPLIANCE

Metropolitan St. Louis Sewer District
Division of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
Phone: 314.768.6200 www.stlmsd.com

November 2, 2012

Dave Vasbinder, Environmental Manager
BRIDGETON LANDFILL LLC
13570 St. Charles Rock Rd.
Bridgeton, MO 63044

RE: WASTEWATER DISCHARGE PERMIT NO. 0511559802 - 2
For premise: 3570 St. Charles Rk. Rd., 63044

Dear Mr. Vasbinder:

As discussed with Bryan Sehie in our telephone conversation on October 31, MSD personnel recently collected and analyzed samples of wastewater discharged to the MSD system from the premise above. Unfortunately, we identified the following exceedances of discharge limitations:

DATE	TIME	SAMPLE POINT	SAMPLE TYPE	POLLUTANT	DISCHARGE LIMIT	LIMIT TYPE	VALUE FOUND
10/04/12	1000	007	Grab	Total Phenols	21 mg/L	IN	38.14 mg/L**
10/05/12	0945	007	Grab	Total Phenols	21 mg/L	IN	77.85 mg/L***
10/10/12	1003	007	Grab	Total Phenols	21 mg/L	IN	60.65 mg/L***
10/11/12	1108	007	Grab	Total Phenols	21 mg/L	IN	53.93 mg/L***

007 = 14" pipe into Westlink Pump Station Wetwell, on S side
mg/L = milligrams per liter IN = Instantaneous
See the enclosure for an explanation of the asterisks appearing in the Value Found column.

We recognize that you already are taking corrective actions under the Administrative Compliance Order issued on 10/26/12. Please keep MSD informed of your progress, as required by the order.

Please refer to the enclosure for additional information on:

a. Potential enforcement actions should noncompliance continue
b. The meaning of the asterisks that appear in the Value Found column above
c. Percentages applicable to Significant Noncompliance, when planning for additional sampling

Thank you for helping us to comply with state and federal regulations. If you have any questions, please contact me at 314.436.8719.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Tom Boehm
Environmental Engineering Associate

Enclosures: SNC enclosure, SP map

cc: Doug Mendoza, MSD
Chris Bulmahn, MSD

Bridgeton Landfill 10738430002

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Hot spot, fumes prompt concern at Bridgeton landfill

6 HOURS AGO • BY JEFFREY TOMICH JTOMICH@POST-DISPATCH.COM314-340-8320

BRIDGETON • Pattonville fire officials are concerned about rising underground temperatures at a north St. Louis County landfill and an odor that's generating complaints from people who live and work in the area.

Matt LaVanchy, assistant chief of the Pattonville Fire Department, said temperatures in one section of the inactive Bridgeton Sanitary Landfill have reached 190 degrees and a 40-foot section of ground has collapsed.

Noxious fumes that are bothering residents come from wells drilled in the landfill to deal with the buildup of heat, he said.

While problems at the landfill, just north of Lambert-St. Louis International Airport, have worsened recently, they are not new.

Problems began in January 2011, when the Missouri Department of Natural Resources reported that data from monitoring equipment at the site indicated high levels of carbon monoxide and carbon dioxide and low levels of methane and oxygen — conditions that indicated a subsurface fire.

DNR said at the time that the fire was believed to be located deep within the south central portion of the landfill, 100 to 150 feet below the surface, and posed no threat to public health.

The agency also said the fire wasn't threatening the nearby West Lake Landfill Superfund site, where Cold War-era radioactive waste is buried.

A DNR spokeswoman wasn't available Monday to answer questions about the cause of the elevated carbon monoxide readings.

Susan David, a spokeswoman for Phoenix-based

Republic Services, which runs the landfill, said the company is working to upgrade the gas management system at the landfill because the waste is decomposing faster than normal. The construction work has resulted in more odor than usual. Last weekend, she said, a gas pipe was damaged, adding to the odor.

As for the collapsed of part of the landfill, she said, "We aren't seeing anything alarming. All landfills settle as they decompose."

Chris Whitley, an Environmental Protection Agency spokesman, said the agency was aware of the situation but that slow-burning underground fires aren't uncommon and there was no threat to the federal Superfund site.

LaVanchy, a member of St. Louis County's hazardous materials response team, said he's spoken with Republic Services and reviewed the company's plans for addressing the heat buildup. The company has told him there's no fire at the landfill, but rather a condition known as "subsurface oxidation."

"We've got a lot of questions," he said. "It's just a matter of trying to understand what's really going on, what potentially could happen and how to manage that."

Among the concerns, LaVanchy said, is what happens if the temperature continues to rise, or the landfill is exposed to oxygen. He's also worried what happens if the problem migrates to the northeast, toward the radioactive waste.

"We could potentially have a very serious situation," he said.

THE METROPOLITAN ST. LOUIS SEWER DISTRICT

ADMINISTRATIVE COMPLIANCE ORDER

IN THE MATTER OF

BRIDGETON LANDFILL LLC
13570 St. Charles Rock Road
Bridgeton, MO 63044

LEGAL AUTHORITY

The following findings are made and order issued pursuant to the authority vested in the Executive Director of the Metropolitan St. Louis Sewer District, under Article IX of MSD's Sewer Use Ordinance No. 12559. This order is based on findings of violations of the conditions of MSD's Sewer Use Ordinance No. 12559 and the Industrial Wastewater Discharge Permit No. 0511559802 issued under Article VI of the Ordinance.

FINDINGS

1. Bridgeton Landfill discharges wastewater into the sanitary sewer system of the Metropolitan St. Louis Sewer District.

2. Bridgeton Landfill is a "significant industrial user" as defined in 40 CFR 403.3(t).

3. Bridgeton Landfill is subject to the terms and limitations contained in MSD's Sewer Use Ordinance No. 12559 which has been in full force and effect at all times during the periods referenced herein.

4. Bridgeton Landfill is subject to the terms and limitations contained in Industrial Wastewater Discharge Permit No. 0511559802 which has been in full force and effect at all times during the periods referenced herein.

5. Pursuant to the above-referenced ordinance and permit, data is routinely collected by or submitted to MSD on the compliance status of Bridgeton Landfill.

6. These data show that, beginning not later than May 15, 2012 and continuing through the present, Bridgeton Landfill has violated the terms of its wastewater discharge permit and the sewer use ordinance in the following manner:

   a. Violations of the discharge limit for Total Toxic Organics
   b. Exceedances of the gas/vapor toxic screening levels for individual toxic organic chemicals, which indicate potential violations of discharge prohibitions against toxic gases, vapors, or fumes in the sewer atmosphere at levels in excess of applicable exposure levels.
   c. Violations of the discharge prohibition against any flammable or explosive substance which creates an atmosphere within the wastewater system which exceeds ten percent of the Lower Explosive Limit.
   d. Violations of the discharge prohibitions against toxic gases, vapors, or fumes in the sewer atmosphere at levels in excess of applicable exposure levels – specifically for hydrogen sulfide and carbon monoxide.

e. Violations of the discharge prohibition against any substance in quantities which either alone or in combination with other wastes results in the formation within the wastewater system of any malodor, foam, or other condition which is capable of creating a public nuisance or hazard to life or interferes with operation and maintenance of the system – specifically for foam.

7. Bridgeton Landfill was informed of the above exceedances and prohibition violations via Notices of Violation from MSD dated: June 11, 2012; June 20, 2012; September 6, 2012; and September 11, 2012

8. Bridgeton Landfill is investigating and implementing additional procedures and pretreatment options to eliminate the above discharge and prohibition violations, as contained in letters from Bridgeton Landfill dated September 12, 2012 and September 20, 2012. The additional procedures and pretreatment options include:
   a. Installation and operation of a supplemental enclosed flare as well as a supplemental "candlestick" utility flare within the landfill's gas control and collection system,
   b. Design and operation of air moving / monitoring engineering controls at the landfill's outfall to the MSD sewer system within the Westlake Pump Station, and
   c. Installation and operation of a foam suppression agent.

ORDER

THEREFORE, BASED ON THE ABOVE FINDINGS, **BRIDGETON LANDFILL** IS HEREBY ORDERED TO:

ITEM	ACTION	COMPLIANCE DATE
1.	Submit to MSD a schedule of actions for design, installation, and operation of the procedures and pretreatment options identified in Finding 8, to the extent that such information has been determined.	November 15, 2012
2.	MSD will review the schedule of actions in action item 1 within 7 days of receipt, and advise Bridgeton Landfill of any deficiencies. Bridgeton Landfill shall correct any deficiencies and include additional scheduling information that has been determined since the previous submittal. Bridgeton Landfill shall submit to MSD this revised schedule of actions.	December 15, 2012
3.	MSD will review the schedule of actions in action item 2 within 7 days of receipt, and advise Bridgeton Landfill of any deficiencies. Bridgeton Landfill shall correct any deficiencies and include additional scheduling information that has been determined since the previous submittal, to be considered as a final schedule. Bridgeton Landfill shall submit to MSD this revised schedule of actions. If a final schedule is not yet determined, Bridgeton Landfill shall inform MSD of the reasons, and may request an extension of the time to submit a final schedule.	January 15, 2013
4.	MSD will review the schedule of actions in action item 3	February 15, 2013

	within 7 days of receipt, and advise Bridgeton Landfill of any deficiencies. Bridgeton Landfill shall correct any deficiencies and obtain MSD approval of the schedule of actions. The approved schedule of actions shall be incorporated into this order the same as if fully set out herein.	
5.	Submit a report demonstrating compliance with the limits and prohibitions contained in the wastewater discharge permit and the sewer use ordinance for Bridgeton Landfill. At a minimum, compliance shall be demonstrated through wastewater sampling for the conditions referenced in Finding 6, at SP007 or at SP008, on at least two separate days.	Not later than 21 days following the final compliance date contained in the approved schedule of actions
6.	Submit a report of progress to MSD for each Action Item. Each report shall state the status of compliance with the Action Item due and shall explain the reasons for any delays, actions being taken to return to schedule and the expected date the missed Action Item will be completed.	Not later than 14 days following the compliance date for each action.

All reports and notices required by this order shall be sent, in writing, to the following address:

Christopher J. Bulmahn
Environmental Engineer
Metropolitan St. Louis Sewer District
10 East Grand Avenue
St. Louis, MO 63147

This order does not constitute a waiver of Bridgeton Landfill's wastewater discharge permit or MSD's Sewer Use Ordinance, which remain in full force and effect. The Metropolitan St. Louis Sewer District reserves the right to seek any and all remedies available to it under Article IX of Sewer Use Ordinance No. 12559 for any violation, including those cited in this order.

So long as Bridgeton Landfill remains in compliance with the terms of this order, MSD will not issue Bridgeton Landfill individual notices of violation for exceedances of the limits and prohibitions identified in Finding 6. However, MSD will inform Bridgeton Landfill of any such exceedances, so that Bridgeton Landfill may investigate and implement short term corrective actions as necessary and available. While not receiving individual notices of violation, Bridgeton Landfill will still be subject to potential findings of significant noncompliance, as defined in MSD's Sewer Use Ordinance No. 12559,

Failure to comply with the requirements of this order shall constitute a further violation of MSD's Sewer Use Ordinance and may subject Bridgeton Landfill to civil or criminal penalties or such other enforcement response as may be appropriate.

This order, entered this 26th day of October, 2012, shall be effective upon receipt by Bridgeton Landfill. This order shall terminate upon completion of the agreed upon schedule of actions, which includes demonstration of a return to compliance.

THE METROPOLITAN ST. LOUIS SEWER DISTRICT

By Susan M Myers

Susan Myers
General Counsel
2350 Market Street
St. Louis, MO 63103-2555
(314) 768-6200

BRIDGETON LANDFILL, LLC

By W.T. Eggleston Jr

Print name: W.T. Eggleston, Jr

Title: VP

13570 St. Charles Rock Road
Bridgeton, MO 63044
(314) 744-8166